King County

E-911 Strategic Plan Scoping

Leadership Group Brief

June 20, 2017

Meeting time & place:
Thursday, June 20, 2017, 9:00-11:00am
at Chinook Building 1st floor Conference Center, Suite 123 (401 5th Avenue).

Leadership Decisions:

- **Process Decisions.** Approve a decision-making matrix for the remainder of the Strategic Planning process. See page 6.
- **Vision, Mission, Core Services**. Decide on the Vision and Mission of E911 Regional System as well as the E911 Program Office's Core Services. See page 7.
- **Finance Principles.** Decide on Finance Principles for the Regional System. See page 8.

Leadership Discussion:

- **Funding Priorities**. Discuss the key issues on System Funding Priorities in advance of a September decision.
- **Technology & Operations Draft #1 Recommendations**. Discuss the Draft #1 (of 2) Recommendations, with special attention to major upcoming decisions about:
    - System Architecture Options
    - NG911 Capabilities Decision Process

  A summary of the key elements in the Draft #1 Recommendations is on page 9, followed by the full text of the recommendations.

- **Governance.** Discuss the key decisions facing Leadership on the overall governing body.

Leadership Packet Contents:

Strategic Planning Schedule:

AGENDA

June 20, 2017 9:00am – 11:00am

Chinook Building 1st Floor Conference Center, Suite 123 |401 5th Avenue

Call in number: **206 263 8114**, Access Code: **119584**

Time	Item	Action	Lead
9:00	**Welcome**	Information	Kathy Lombardo, King County + Lora Ueland, Valley Comm
9:05	**Process Update**	Info / Decision	Brian Scott, BDS
9:15	**Vision, Mission, Core Services**	Decision	Brian
9:35	**Finance Principles**	Decision	Marilynne Beard, Sound Cities + Tom Koney, King County
9:50	**Funding Priorities**	Discussion	Marilynne + Tom
10:05	**Technology & Operations Draft #1 Recommendations** - System Architecture Options - NG911 Capabilities Decision Process - Equity Update	Info / Discussion	Chelo Picardal, City of Bellevue Bill Kehoe, King County + Andrés Mantilla, CBE Strategic
10:45	**System Governing Body**	Discussion	Stacey Jehlik, City of Seattle Diane Carlson, King County
11:00	**ADJOURN**		

Materials:

- Strategic Plan Decision Matrix
- Vision, Mission, Core Services
- Finance Principles
- Technology & Operations Draft #1 Recommendations

LEADERSHIP GROUP

Councilmember Jennifer Robertson
CITY OF BELLEVUE

Mayor Liz Reynolds
CITY OF ENUMCLAW (SOUND CITIES)

Councilmember Tola Marts
CITY OF ISSAQUAH (SOUND CITIES)

Executive Dow Constantine
KING COUNTY

Councilmember Reagan Dunn
KING COUNTY

Councilmember Kathy Lambert
KING COUNTY

Councilmember Claudia Balducci
KING COUNTY

Sheriff John Urquhart
KING COUNTY

Executive Director Tom Orr
NORCOM

Commander Erik Scairpon
REDMOND POLICE DEPARTMENT

Mayor Denis Law
CITY OF RENTON (SOUND CITIES)

Councilmember Lorena González
CITY OF SEATTLE

Council President Bruce Harrell
CITY OF SEATTLE

Commissioner Tim Osgood
WOODINVILLE FIRE AND RESCUE

Brian Maxey
SEATTLE POLICE DEPARTMENT

Tom Koney (non-voting)
KING COUNTY EXECUTIVE SERVICES

PLANNING GROUP

Kathy Lombardo, Co-Chair
KING COUNTY E-911 PROGRAM OFFICE

Lora Ueland, Co-Chair
VALLEY COMMUNICATIONS CENTER

Chad Barnes
CITY OF BELLEVUE

Commander Chris Wilson
ISSAQUAH POLICE DEPARTMENT

Diane Carlson
KING COUNTY EXECUTIVE'S OFFICE

Lise Kaye
KING COUNTY COUNCIL STAFF

Patti Cole-Tindall
KING COUNTY SHERIFF'S OFFICE

Marilynne Beard
CITY OF KIRKLAND (SOUND CITIES)

Edie Gilliss
CITY OF SEATTLE MAYOR'S OFFICE

Commissioner Tim Osgood
WOODINVILLE FIRE AND RESCUE

Brian Smith
SEATTLE POLICE DEPARTMENT

Meg Goldman (non-voting)
KING COUNTY EXECUTIVE SERVICES

TASK FORCE CHAIRS

Diane Carlson, Governance
KING COUNTY EXECUTIVE'S OFFICE

Edie Gilliss, Governance
CITY OF SEATTLE MAYOR'S OFFICE

Bill Kehoe, Technology
KING COUNTY INFORMATION TECHNOLOGY

Chelo Picardal, Technology
CITY OF BELLEVUE

Marilynne Beard, Finance
CITY OF KIRKLAND (SOUND CITIES)

Tom Koney, Finance
KING COUNTY EXECUTIVE SERVICES

January 19, 2017 9:00am – 11:00am

Chinook Building

1st Floor Conference Center, Suite 123 | 401 5th Avenue

LG Members Attending:

Tola Marts	John Urquhart	Denis Law
Liz Reynolds	Tom Orr	Brian Maxey
Claudia Balducci	Erik Scairpon	Tim Osgood
Kathy Lambert	Tom Koney	

LG Members Not Attending:

Jennifer Robertson	Reagan Dunn	Lorena González
Dow Constantine	Bruce Harrell	

Guests Attending:

Kathy Lombardo, E-911	Diane Carlson, KC Executive	Patti Cole-Tindall, KC Sheriff
Edie Gilliss, City of Seattle	Lora Ueland, Valley Comm	Lise Kaye, KC Council
Jane Christensen, Redmond	Bill Kehoe, KCIT	Krista Camenzind, KC Council
Jessica Sullivan, KCSO	Tom Goff, KC Council	Chelo Picardal, Bellevue
	April Sanders, KC Council	

Consultants Attending:

Brian Scott, BDS	Tim Ceis, CBE	Kevin Kearns, IXP
Gabriel Silberblatt, BDS	Andrés Mantilla, CBE	Morgan Shook, ECONorthwest
Heather Manning, BDS	Kate Nolan, CBE	~~Tessa Krebs, ECONorthwest~~

Time	Action Items in YELLOW.
9:00	**Welcome / Strategic Plan Refresher** 9/20/16 Minutes: Approved.

9:05 **Program Updates**

CM Lambert: Likes the team's transition to KCIT, believes it will help with clarity and transparency about Program Office priorities.

9:15 **Process Update**

The following roster alterations were approved by LG:

- Task Forces will have two co-chairs each
- Brian Maxey, Seattle PD, replacing Ronald Rasmussen on the LG
- Tom Koney, KC Executive Services, replacing Jody Miller as non-voting member of the LG
- Brian Smith, Seattle PD, replacing Ronald Rasmussen on the PG

Equity Engagement Evolution

CM Balducci expressed concern that the equity groups will be engaged too late in the process.

CBE will bring the results of the Equity outreach to the LG so that they can see it and ensure that they are being incorporated into the final recommendations.

9:30 **Issue Brief**

CM Lambert expressed concern about vendor performance monitoring

Exec Summary

Syntax change on page 3: "…Key Issues as topics for deeper analysis…"

Governance Key Issues

Under Decision-making, on page 3: "challenges *and* opportunities"

Technology & Operations Key Issues

CM Balducci wants to ensure that "vendor competition and interoperability" are incorporated as a part of this TFs key issues.

Kevin Kearns assures CM Balducci this is a critical focus for the Task Force.

Finance Key Issues

None.

Issue Brief approved with modifications described above.

10:15 **Technology Draft Update & Expectations**

Sheriff Urquhart: KC forecasted to grow by 1M people in the next ten years, we need to plan for that capacity.

LG approves of Technology & Operations direction.

10:50 **Round Table**

11:02 Adjourned.

KING COUNTY E-911 STRATEGIC PLAN DECISION-MAKING PROCESS

BLUE = Planning Group: Role – **Recommend** to Leadership Group

RED = Leadership Group: Role – **Decide** on recommendation to King County Council

King County

KC Regional E-911 Critical Decision Points	June 6/12 6/20	Jul 7/17	Aug 8/21	Sept 9/18 9/29	Oct 10/16	Nov 11/9	Dec 12/19
Regional System							
Vision	Decide						
Mission	Decide						
Core Services	Decide						
Technology & Operations							
Architectural Options (w/ costs)	Discuss	Discuss	Recommend	Decide			
NG911 Capabilities Decision Process	Discuss	Discuss	Recommend	Decide			
NG911 Features & Functions (2017-18)	*Program Office / IAG (Decisions in progress – not a part of strategic planning)*						
Finance							
Finance Principles	Recommend Decide						
Funding Priorities	Discuss Discuss	Discuss	Recommend	Decide			
Financial Plan (10-year)			Discuss	Discuss	Recommend	Decide	
Escrow Distribution Formula (2017-2018)	*Program Office / IAG (Decisions in progress – not a part of strategic planning)*						
Governance							
Overall Governing Body (principles, composition, authority, voting, etc.)	Discuss Discuss			Discuss	Recommend	Decide	
Boards/Subcommittees Structure (Technology & Operations, Finance)	Discuss			Discuss	Recommend	Decide	
Strategic Plan							
Final Plan					Recommend	Decide	Submit

version 15

Vision, Mission, Core Services
June 20, 2017

Regional E911 System Vision

King County's Regional E911 System will be among the best in the country in terms of:

- Rapid and effective routing of requests for service;
- Efficient use of public resources;
- Effective deployment of evolving technology
- Adherence to the guiding principles

Mission of the E911 Regional System

The Mission of the E911 System is to provide the people of King County with a secure and reliable communications link to emergency services.

E911 Program Office Core Services

- **Network, System, & Equipment**
  Call Delivery from State 911 network to PSAPs; E911 phone maps; location data; GIS data; local network, security, and trunking.
- **Operations & Maintenance**
  Hardware for network, security, and telephony equipment; asset tracking; software licensing, updates, upgrades, fixes; vendor and PSAP coordination; transferring funds to PSAP for technical staff, PSAP operations, and equipment.
- **Project & Vendor Management**
  Project planning, budget and management; vendor delivery oversight and compliance.
- **System Access & Education**
  Social marketing strategies; education campaigns, events, training and materials; language interpretation services.
- **Regional Leadership**
  Local, state, and national associations and committees; legislative efforts; new technology and trends.
- **Administration & Finance**
  Program, vendor, and asset management; policies; staffing; data analysis; communications; budget; finance; strategic planning.

Finance Principles
June 20, 2017

Role of Principles

In the context of the E911 Strategic Plan, principles shape desired goals, objectives, and outcomes. Principles serve as a type of filter, evaluation criteria for informing priorities and strategies.

Context from Scoping

The following three principles come from the E911 Strategic Plan scoping document and represent guidance set forth for this effort from the plan's sponsors.

1. **Fiscal Responsibility** – Equitable, transparent, and responsible fiscal management
2. **Financial Sustainability** – Manage toward long-term financial sustainability
3. **Cost Effective** – Leverage resources to provide the best possible services

Refinement by Finance Task Force

The Finance Task force accepts the key principles from scoping and has further refined them based on our discussions. Each principle has been given working definition and list of key objectives.

Finance Principles

1. The Fiscal Responsibility Principle

We must rely on clearly articulated financial management policies that reflect responsible stewardship of E911 resources, ensure that they are used for their intended purposes. We must be open and transparent about all the E911finances, making financial information available to all stakeholders, and build trust and collaboration among partners.

Objectives:

- Employ budget, financial, and accounting policies and procedures that are coordinated, coherent and, consistent across all levels of the system, primarily, King County and the PSAPs.
- Achieve fair and consistent allocation of resources to the entire system (e.g. King County and PSAPs) that support E911 system functionality.
- Provide clear, accurate, and timely financial reports to inform the key stages of policy formulation, budgeting, implementation, and review.
- Provide objective performance information to show that the system's efforts are becoming more efficient, effective, and accountable.

2. Fiscal Sustainability Principle

The E911 system should make effective and efficient use of resources, achieve E911 objectives, fulfill commitments to stakeholders, and prepare for long-term fiscal sustainability. Financial sustainability of E911 revenues is important to the services delivered by both the King County Program Office and PSAPs.

Objectives:

- Employ budget approaches that lead to structurally sound fiscal decisions that support the capital and operational needs/objectives of the E911 system. This includes addressing both expenditure and revenue needs.

- Maintain distinct capital and operating budgets.
- Prioritize funding on investment and operation in the regional system before other eligible E911 expenses that expand services.
- Assure that appropriate budget measures are in place to fund expected investments and unexpected events, including sufficient reserves for equipment replacement, operating expenditures and capital investment.

3. The Cost Effective Principle

We should invest and spend available resources in building and operating a more efficient E911 system. Investments in the E911 system need to be effective and reinforce broader program goals.

Objectives:

- Identify basic levels of service for defined deliverables to achieve predictable staffing levels at King County and PSAPs.
- Define and advocate for favorable terms for procured third-party contracts for network and technology services.
- Assure that budget and expenditure planning reflect understanding of total cost of ownership across the system.
- Assure consistent and efficient use of E911 resources throughout the regional system including funds allocated to the PSAPs.

EXECUTIVE SUMMARY

This is a summary of findings and recommendations in *Technology & Operations DRAFT #1* from the King County Regional E911 Strategic Plan Technology & Operations Task Force.

The strategic planning process was set in motion by King County Ordinance 18139, and shaped by the Scoping Committee in its Strategic Planning Process Report of May 31, 2016. This *Technology & Operations DRAFT #1* is preceded by an *Issue Brief* that was approved by the Leadership Group on January 19, 2017. The Scoping Committee identified a Shared Vision, Guiding Principles, and Goals.

The Vision, Guiding Principles, Goals, Strategic Questions, and Key Technology & Operations Issues are summarized in Appendix 1. The full Technology & Operations Draft #1 appears as Appendix 2.

Key Technology & Operations Findings & Recommendations

The major challenge of the King County Regional E911 Strategic Plan is defining the governance, financing, technology, and operations framework to enable the regional system to move fully into "Next Generation 911" (NG911). For the purposes of this strategic plan, the working definition of *NG911 is the transition of the 911 system from analog to digital communications technology, reflecting today's internet-based world*.

This transition of analog to digital communications technology opens new capabilities beyond voice to deliver text, photo, video, and data from a caller to a 911 call center (PSAP) and potentially to a responder. Text and video communications – in particular – can impact accessibility to 911 for individuals with speech and hearing disabilities. NG911 also enhances PSAP operations with more accurate call location and routing, and enables connections between PSAPs that improve call transfers and interoperability for greater overall resiliency. NG911 is driven by national and statewide efforts, and each regional E911 program can decide on which NG911 capabilities best align with its priorities, customer expectations, resources, and technology portfolio, as well as when and how those new capabilities should be phased in.

The Technology & Operations Task Force is charged with identifying the objectives, actions, and performance measures to make NG911 a reality in King County. For Leadership Group purposes, there are two major issues requiring Technology & Operations decisions. These are the System Architecture approach and the ongoing Technology & Operations decision framework so that the regional system can keep up with evolving technologies.

Architectural Principles

The Task Force developed the following **Architectural Principles** to guide recommendations for Strategic Objectives, Actions, and Performance Metrics that also follow the Goals named above.

1. **Public Safety** – Ensure that 911 services protect the public's safety above all else.
2. **Security** – All systems and solutions meet the minimum levels of security defined.
3. **Fair and Equitable** –Provide fair and equitable access to 911 services so that communities across King County receive and perceive value.

4. **Cost Effectiveness** – Financial decisions are the most cost-effective solutions consistent with documented needs.
5. **Capacity** – The system is designed to meet peak demands without service interruption.
6. **Availability** – Solutions are available at all times without service interruption.
7. **Interoperability** – Software and hardware conform to defined standards of interoperability for data, applications and technology.
8. **Convergence** – Converge toward common solutions, approaches and standards.

Categories

Strategic Objectives, Actions and Metrics will be organized into the following categories.

1. **Next Generation 911 (NG911) Readiness** – Preparing for the emerging capabilities of NG911 (e.g., text, photos, video, telematics, etc.) with a roadmap that adopts and adapts to technology changes, and balances operational needs with improved service and cost effectiveness.
2. **Integrated and Interoperable Systems** – Ensuring systems are integrated effectively to achieve reliable interoperability across organizations and functions in delivering seamless 911 services across the region.
3. **Security and Resiliency** – Protecting the 911 call flow, beginning at the State's ESInet, continuing through the various systems and transport mechanisms, and arriving at the PSAPs, while also ensuring the overall resiliency of the E911 systems and operations.
4. **Optimized Operations** – Providing reliable 911 services across King County that meet or exceed applicable standards by providing a combination of hardware and software systems, databases, networking and operational support that accurately locate and route calls to King County PSAPs delivered from the State ESInet.
5. **Accessible and Equitable Service** – Increasing equitable access to the 911 services for all communities and individuals served, with specific focus on lessening obstacles faced by groups with unique needs.

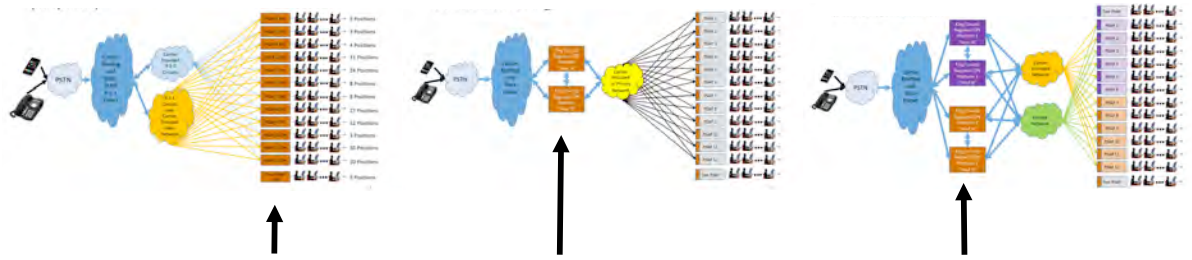
Architectural Options

The first major decision in Technology & Operations is the system architecture. This decision has significant cost and far-reaching implications for system. The Task Force narrowed the system architectural options to three: 1 – the existing *Decentralized* architecture; 2 – a *Single Platform* architecture; or 3- a *Dual-Platform* architecture. These platforms are illustrated below.

Each of these systems is a viable alternative that can provide redundant and diverse networking to avoid or mitigate system breakdowns. The primary difference between these architectural platforms is in what manner the system provides identical yet independent telephony equipment to route 911 calls. Identical yet independent is important so that one can seamlessly replace the other in case of failure. In the current decentralized architecture, there are twelve of these pieces of equipment (one in each of the twelve Public Safety Answering Points). In a single-platform architecture, there would be two (one replacing the other in case of failure). In a dual-platform architecture, there would be four of these identical yet independent pieces of telephony routing equipment (thus providing multiple redundancies in case of failure).

The Technology & Operations Task Force is currently evaluating these options in light of the architectural principles above and developing cost estimates for these systems. In terms of cost, there are issues related to the equipment itself, the system to connect to the equipment, and the staffing to service the equipment.

The Leadership Group will be briefed on this issue in preparation its June meeting, and again through the summer to set up a decision at its September meeting.



12 "hosts"
DECENTRALIZED

2 "hosts"
SINGLE-PLATFORM

4 "hosts"
DUAL-PLATFORM

Features & Functions Decision Framework

The other major decision in Technology & Operations is a framework for making future choices about implementation of the many features and functions for the system. Like technology everywhere, new features and functions become available all the time. This requires an ongoing series of discussions and decisions about what to buy, when to buy it, how to deploy it, and responsibilities for its maintenance. Because of the technical and multi-jurisdictional nature of the King County Regional E911 System, we need a decision framework in place so that technology people can work together to develop recommendations that can then be acted upon by a whole collection of local and regional jurisdictions. The strategic plan needs to establish this framework.

Appendix 1:

King County E-911 Strategic Plan

Summary of Vision, Guiding Principles, Goals, Strategic Questions, & Key Issues

Shared Vision, Mission, Guiding Principles, and Goals

Shared Vision — for the Regional E-911 System

King County's Regional E-911 System will be among the best in the country in terms of:

- Rapid and effective routing of requests for service;
- Efficient use of public resources;
- Effective deployment of evolving technology; and
- Adherence to the guiding principles.

Mission — for the Regional E-911 System

In progress: *Clarity and agreement about the current and future core service responsibilities and associated costs of the King County Regional E911 System and Program Office is being developed during this strategic planning process. (due to the Leadership Group in June 2017)*

Guiding Principles — for the Regional E-911 System

1. Process
   a. Transparency
   b. Project Management Principles
   c. Collaboration
   d. Predictability
   e. Advocacy
   f. Inclusion
2. Finances
   a. Fiscal Responsibility
   b. Financial Sustainability
   c. Cost Effective
3. Standards
   a. National Best Practices
   b. Performance Metrics
   c. Continuous Improvement

Goals — for the Regional E-911 System

As part of the strategic planning process, develop a dashboard of outcome metrics to monitor progress toward these goals, to be in alignment with the guiding principles above.

1. No Request Lost
2. Prompt Response
3. Seamless System-wide Technology
4. Meet or Exceed Industry Standards
5. Equity
6. Secure, Resilient & Survivable

Strategic Questions

The Scoping Committee also identified a number of strategic questions to guide the work of the Task Forces, including these Technology & Operations questions:

Technology & Operations

T1. What is the technology vision for the King County Regional E-911 System, in terms of the technology's purpose, evolution, and investment approach?

T2. What are the technology requirements for integrating with the state's E-911 system, and for local jurisdictions to connect to the regional E-911 system?

T3. What is the ongoing decision process for technology investments, including options, tradeoffs, priorities, budgets, and schedules?

T4. What are the ongoing performance metrics for technology in the King County Regional E-911 System, including the performance of the system, vendors, and local partners?

T5. What are the security requirements for the King County Regional E-911 System, including protection of the system, individual privacy, and proprietary information?

Key Issues

The Technology & Operations Task Force also identified the following Key Issues as a comprehensive check-list of topics to be addressed for the strategic plan to answer the questions above. This list was approved by the Leadership Group on January 19, 2017.

Technology & Operations

- **Pace of Change:** The pace of technology change brings new public and user expectations that can stress the Regional E-911 System and its operations, and will require a continuous process to review and evaluate new changes and fiscal impacts.
- **Architecture Complexity and Strategy:** The overall architecture of the Regional E-911 System needs to be evaluated, with a strategy developed to respond to overall system objectives and evolving future conditions. This may require an ongoing Technology & Operations committee to conduct continuous review and evaluation.
- **Security:** Security of the Regional E-911 System overall, as well as other critical PSAP systems, needs to be a constant focus and priority.
- **Call and Operational Complexity:** The nature of emergency calls is changing rapidly, with ever-increasing volumes of calls from wireless devices and emerging technologies such as text, video and telematics calls to 911. This will drive a variety of ongoing technological, operational and funding issues for the Regional E-911 System overall and the systems and operations at the individual PSAPs. A technology and operations strategy must balance operational impacts with effectiveness gains from technology in a diverse environment with geographically distributed PSAPs, different jurisdictional boundaries and variety of call types handled by various PSAPs.

Appendix 2:

King County E-911 Strategic Plan

Technology & Operations – Draft 1

Strategic Plan Outline

Executive Summary *[to come at end]*

Contents *[in progress]*

Acknowledgements *[to come at end]*

Process and Context *[in progress — Process Brief]*

1. *Description of the KC E-911 strategic planning process*
2. *Why and how the plan was developed*
3. *Summary report of key lessons from the comparable practices research of all three task forces.*

E-911 System Existing Conditions and Background *[Complete — Issue Brief]*

Key Issues

The most critical issues currently facing the King County Regional E-911 System, as articulated by the Strategic Plan Task Forces in the Issue Brief.

Governance	Technology & Operations	Finance
Decision-Making Authority, Feedback, and Transparency Conflict Resolution Coordination/Communication	Pace of Change Architecture Complexity and Strategy Security Call & Operational Complexity	Fiscal Sustainability Clarity of Financial Responsibilities Financial Policies & Accountability Distribution of Funding

Vision *[complete from Scoping and approved at September LG]*

An aspirational statement of what the King County Regional E-911 System should be in the future, as initially defined during Scoping.

Vision
King County's Regional E-911 System will be among the best in the country in terms of: Rapid and effective routing of requests for service; Efficient use of public resources; Effective deployment of evolving technology; and Adherence to the guiding principles.

Values *[complete from Scoping as Guiding Principles; approved at September LG]*

Major tenets that identify the way the King County Regional E-911 System will pursue its Shared Vision, as initially defined during Scoping.

Values		
Process	Finances	Standards
Transparency Project Management Principles Collaboration Predictability Advocacy Inclusion	Fiscal Responsibility Financial Sustainability Cost Effective	National Best Practices Performance Metrics Continuous Improvement

Mission of the E911 Regional System *[for Leadership adoption in June]*

The Mission of the E911 System is to provide the people of King County with a secure and reliable communications link to emergency services.

Mission of the E911 Program Office *[for Leadership adoption in June]*

The E911 Program Office provides the people of King County with access to cost effective, secure, reliable, accurate and relevant 911 technologies and services.

E911 Program Office Core Services *[for Leadership adoption in June]*

- **Network, System, & Equipment**
- **Operations & Maintenance**
- **Project & Vendor Management**
- **System Access & Education**
- **Regional Leadership**
- **Administration & Finance**

Goals *[complete from Scoping; approved at September LG]*

Prioritized future conditions and targets serving as an intermediate step toward achieving the Shared Vision in line with the Guiding Principles, as initially defined during Scoping.

Goals
7. No Request Lost 8. Prompt Response 9. Seamless System-wide Technology 10. Meet or Exceed Industry Standards 11. Equity 12. Secure, Resilient & Survivable

Technology & Operations Strategic Objectives, Actions, & Performance Metrics

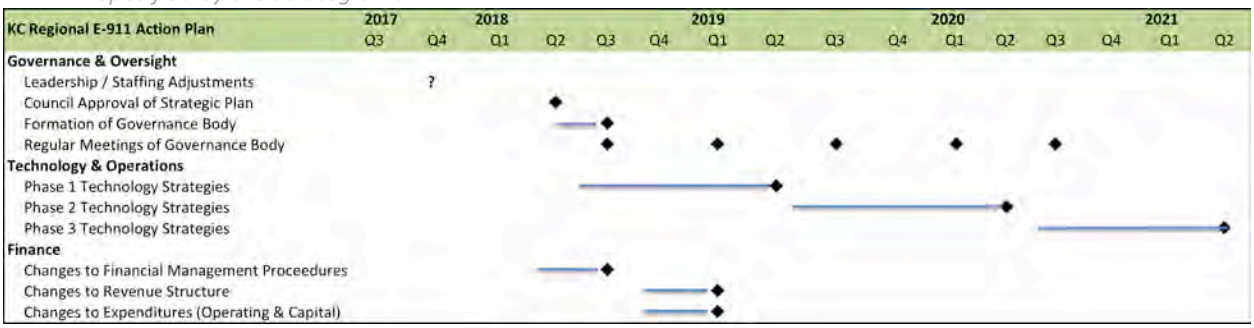
Categories	Objectives (what)	Actions (how)	Measures & Targets (how many)
NG911 Readiness	*Objective #1:* ***Adhere to Standards***	A. NENA i3 Standards B. NENA Network & Interoperability Standards C. ESInet Standards	TBD
	Objective #2: ***Identify NG911 Features***	A. NG911 Features: – interim text-to-911 – enhanced text-to-911 – telematics – "over-the-top" apps B. Evolution of Standards C. Decision Criteria D. Implementation Timeline E. "Over-the-top" Applications	Implementation timeline by XXX
	Objective #3: ***Identify NG911 Functions***	A. NG911 Functions: – ESInet II – geospatial routing – SIP call transport – call security – call routing policies – ADR functionality – location information – agency locator support B. Evolution of Standards C. Implementation Timeline	Implementation timeline by XXX
	Objective #4: ***Evaluate and Adopt a System Architecture***	A. Identify Options: 1: Decentralized 2: Single Platform 3: Dual Platform B. Review Options against Architectural Principles C. Review Options on Financial Criteria	Assessment of Architectural Options by XXX date Decision on Future Architecture by XXX date

Categories	**Objectives** (what)	**Actions** (how)	**Measures & Targets** (how many)
Integrated and Interoperable Systems	*Objective #1:* ***Identify Interoperability Features***	A. Identify Options: – Carrier Diversity – High Availability – Survivability – Virtual PSAPs – Mobile PSAPs – Real-time Data Capture and Analysis B. Maturity of Standards C. Implementation Timeline	Implementation timeline by XXX
	Objective #2 ***Identify Interoperability Functions***	A. Identify Options: – Existing Structure – PSAP Needs – Bottlenecks – Potential Efficiencies – Routing Protocols – Data Protocols B. Maturity of Standards C. Implementation Timeline	Implementation timeline by XXX
Security and Resiliency	*Objective #1:* ***Security Standards***	A. Staffing & Funding B. Certification Process C. Security Awareness Training	Annual staff security training: 75% in 2018, 85% in 2019, and 100% in 2020 +.
	Objective #2: ***Security Program***	A. Security Policies B. Staffing & Funding	Governance structure in 1Q 2018.
	Objective #3: ***Operations and Architecture***	A. Implement IT Best Practices	Implement a process to measure key performance.
	Objective #4: ***Vendor Management***	A. Vendor Management Best Practices B. Quarterly Reports	**Measurements:** Include the standard language in all new vendor contracts and RFPs

Categories	**Objectives** (what)	**Actions** (how)	**Measures & Targets** (how many)
Optimized Operations	*Objective #1:* ***Standards and Policies***	A. Demarcation Points B. Standards & Policies C. Governance	Routine review of E911 Program and PSAPs conformance
	Objective #2: ***Delivery Framework***	A. KCIT Delivery Framework B. Project Management Standards	Creation and utilization of these delivery frameworks
	Objective #3 ***Operational Framework***	A. KCIT Operational Framework B. Problem Management	Creation and utilization of these operational frameworks
	Objective #4 ***Business Continuity Management***	A. KCIT Business Continuity Management B. KCIT Coordination	Creation and utilization of these BCM strategies
	Objective #5: ***Call Routing and Delivery***	A. Routing Criteria B. Periodic Review	Creation and utilization of these call routing strategies.
Accessible and Equitable Service	*Objective #1: Public Education and Awareness*	A. Public Education & Outreach B. Expand Awareness C. Relationships	TBD
	Objective #2 Reducing Barriers for non-English Speakers	A. Performance Measures B. RFP Development C. Multiple Vendors	Tabulate non-English calls to 911 Evaluate vendor performance
	Objective #3: Modernizing Technology	A. Interim text-to-911 B. Text-to-911 Evolution C. Up-to-Date Technologies	TBD
Governance	*Objectives – TBD*	Actions – TBD	Metrics – TBD
Finance	*Objectives – TBD*	Actions – TBD	Metrics – TBD

Implementation Timeline *[to come in the first draft of the Strategic Plan]*

A detailed schedule for the phased delivery of the technology, finance, and governance actions specified by the Strategic Plan.



Ten-Year Fiscal Sustainability Plan *[to be outlined in the Finance Draft Recommendations]*

Budget forecasts that solve for budget deficits resulting from the implementation of the technology, finance, and governance task force recommendations. Detail will be at the summary line item basis.

Definitions

Next Generation - (NG911):
For the purposes of this strategic plan, the working definition of NG911 is:

> ***The transition of the 911 system from analog to digital***
> *communications technology, reflecting today's internet-based world.*

This transition of analog to digital communications technology opens **new capabilities** beyond voice to deliver text, photo, video, and data from a caller to a 911 call center (PSAP) and potentially to a responder. Text and video communications – in particular – can impact **accessibility to 911** for individuals with speech and hearing disabilities. NG911 also **enhances PSAP operations** with more accurate call location and routing, and enables connections between PSAPs that improve call transfers and interoperability for greater overall resiliency. NG911 is driven by national and statewide efforts, and each Regional E911 program can decide on which NG911 capabilities best align with its priorities, customer expectations, resources, and technology portfolio, as well as when and how those new capabilities should be phased in.

Emergency Services Internet-Protocol Network (ESINet; ESINet II):
The statewide system for routing emergency calls. The State of Washington is in the process of deploying a new ESInet, often referred to as ESInet II.

Feature:
A distinctive attribute or aspect of some technology. In this planning context, *features* are used within the PSAPs as part of answering and processing 911 calls.

Function:
The basic purpose of some element of the technology. In this planning context, *functions* are NG911 capabilities within the ESInet or the Regional E911 telephone system.

Interoperability:
The ability of computers, technology systems, or software to exchange and make use of information

NENA: National Emergency Number Association

Public Safety Answering Points (PSAPs):
Answering locations for 911 calls. In King County, the twelve PSAPs are governed and largely funded by the independent jurisdictions and agencies they serve.

Reliability: The quality of being trustworthy or of performing consistently well

Resilience: The capacity to recover quickly from difficulties

In the following sections of this draft:

- Yellow highlights are meant to call the Planning Group's attention to issues of timeliness, high level importance, or political tension
- Blue highlights are meant to call attention to questions of Governance or Finance. Most of these are about who makes decisions now and over time. Governance Task Force discussions are underway about decision-making, advisory roles, and lines of authority. For purposes of this draft, we have used "E911 Program Office" to describe the entity that will be implementing many of the actions in this plan. The governance and decision-making authority of the E911 Program Office is to be determined as the planning process continues.
- Pink highlights are meant to call attention to timing issues. In particular, calling attention to decisions that we may want to complete during strategic planning.

Technology and Operations — Preliminary Recommendations

Architectural Principles

The following **Architectural Principles** will guide recommendations for Strategic Objectives, Actions, and Performance Metrics that also follow the Goals named above.

9. **Public Safety** – Ensure that 911 services protect the public's safety above all else.
10. **Security** – All systems and solutions meet the minimum levels of security defined.
11. **Fair and Equitable** –Provide fair and equitable access to 911 services so that communities across King County receive and perceive value.
12. **Cost Effectiveness** – Financial decisions are the most cost-effective solutions consistent with documented needs.
13. **Capacity** – The system is designed to meet peak demands without service interruption.
14. **Availability** – Solutions are available at all times without service interruption.
15. **Interoperability** – Software and hardware conform to defined standards of interoperability for data, applications and technology.
16. **Convergence** – Converge toward common solutions, approaches and standards.

Categories

Strategic Objectives, Actions and Metrics are organized into the following categories.

7. **Next Generation 911 (NG911) Readiness** – Preparing for the emerging capabilities of NG911 (e.g., text, photos, video, telematics, etc.) with a roadmap that adopts and adapts to technology changes, and balances operational needs with improved service and cost effectiveness.
8. **Integrated and Interoperable Systems** – Ensuring systems are integrated effectively to achieve reliable interoperability across organizations and functions in delivering seamless 911 services across the region.
9. **Security and Resiliency** – Protecting the 911 call flow, beginning at the State's ESInet, continuing through the various systems and transport mechanisms, and arriving at the PSAPs, while also ensuring the overall resiliency of the E911 systems and operations.
10. **Optimized Operations** – Providing reliable 911 services across King County that meet or exceed applicable standards by providing a combination of hardware and software systems, databases, networking and operational support that accurately locate and route calls to King County PSAPs delivered from the State ESInet.
11. **Accessible and Equitable Service** – Increasing equitable access to the 911 services for all communities and individuals served, with specific focus on lessening obstacles faced by groups with unique needs.

The following sections outline current status, objectives, actions, and performance metrics for these categories. Each section begins with an overview of the E911 system's current state and in-progress initiatives. This is followed by a list of objectives with actions and a placeholder for performance metrics and targets (which will come later).

Next Generation 911 (NG911) Readiness

Preparing for the emerging capabilities of NG911 (e.g., text, photos, video, telematics, etc.) with a roadmap that adopts and adapts to technology changes, and balances operational needs with improved service and cost effectiveness.

Current State and In-Progress Initiatives

There are several in-progress initiatives, or aspects of the current environment, that serve as a baseline for this Strategic Category:

The State of Washington is in the process of deploying a new Emergency Services IP Network (ESInet), often referred to as ESInet II. This network is being established in conformance with current National Emergency Number Association (NENA) i3 architectural standards and is planned to evolve with those standards as they undergo periodic upgrades and/or enhancements. When completed, will begin to offer the ability to implement a variety of NG911 Features and Functions to the PSAPs in Washington State if those PSAPs have implemented compatible systems and desire to utilize these Features or Functions.

The King County E911 Program Office (E911 Program Office) currently utilizes a decentralized system architecture, so transitioning the current architecture to an NG911 capable environment would require upgrades and/or enhancements at each of the PSAPs in the county. Currently all the PSAPs use a common vendor (West Safety Systems' VIPER 911 telephone systems). The larger PSAPs in King County have recently undergone a refresh cycle for this equipment, and this work is now being planned for the smaller PSAPs. Further evaluation of these systems will be needed as the State's ESInet II is deployed to determine if further enhancements would be needed to meet desired Feature, Function and Security requirements.

The E911 Program Office is engaged in an interim deployment of Text-to-911 technology that should be able to provide this capability to the PSAPs until the full deployment and functionality of ESInet II is in place.

*NG 911 Readiness Objective #1 – **Adhere to Standards***

The E911 Program Office will only pursue technology investments that are consistent with the NENA i3 framework and compatible with the ESInet II being deployed by the State of Washington.
(Goal: Meet or Exceed Industry Standards.)

The following **Actions** will be taken:

A. **NENA i3 Standards** – Monitor the NENA i3 standards process (current version NENA-STA-010.2-2016) to guide decisions on technologies and service providers.

B. **NENA Network & Interoperability Standards** – Monitor NENA Network & Interoperability Standards (03-004; 03-503; 03-506) to achieve compliance and guide future architectural decisions.

C. **ESInet Standards** – Monitor Washington ESInet standards and guidelines, such as E-911 and NG911 Systems and Network Infrastructure and Security Standards for Washington State Public Safety Answering Points, to guide integration efforts and future decisions

Metrics & targets for this Objective have not yet been formulated.

*NG911 Readiness Objective #2 – **Identify NG911 Features***

The E911 Program Office will partner with the future governing entity to consider and adopt appropriate NG911 features as they become available. These features are NG911 capabilities that the PSAPs would use in handling 911 interactions with the calling public.
(Goals: Meet or Exceed Industry Standards; Equity.)

The following **Actions** will be taken:

A. **NG911 Features** – Pursue NG911 Features that have the greatest customer and operational benefit, including interim text-to-911; evolved text-to-911; telematics; and "over-the-top" applications. (These are summarized below, with a more detailed explanation of these features and their evolving technologies appears in Appendix B.)

Interim Text-to-911. The ability for the public to interact with 911 via text messaging is already an E911 Program Office priority, and an interim solution[1] will be deployed by early 2018.

The interim solution will use the wireless carrier's short message service (SMS) text messaging services. No photos or additional material can be attached to these messages. Messages are delivered by the telecommunications carrier to the PSAPs through their 911 telephone system or through a stand-alone internet connection.

Enhanced Text-to-911. There are two important steps coming in the ability to interact with 911 via text messaging. These are Multimedia Messaging Emergency Services (MMES) and Real Time Text (RTT). These technologies will allow several enhanced text-to-911 functions that will improve timely bi-directional communication. How soon these will be available is unclear, but the Federal Communications Commission (FCC), major telecommunications carriers, and local E911 systems see this as a priority. When available, this technology will become an important improvement and replacement of TTY services for the deaf community. Migration to this technology may take place within 2 years.

In the years ahead, the E911 Program Office will monitor technological progress and adopt standards, technologies, and region-wide policies in a timely manner to evolve the system's text-to-911 capabilities. (Details appear in Appendix B.)

Telematics. The automotive industry currently transmits a broad array of automatic crash notification and data to private call centers, such as OnStar. Some in the 911 and emergency services field believe this data would be useful to either 911 centers or to responding agencies if it could be transmitted to them before arrival at the scene. There is considerable debate about whether the 911 centers should be involved with this data, and even whether the data is useful in the field, particularly when response times are short.

As with evolving NG911 features, the E911 Program Office will monitor technological progress and adopt standards, technologies, and policies in a timely manner to stay current with industry standards. Telematics upgrades may be available in 2020 to 2022 (Details appear in Appendix B.)

Over the Top (OTT) Applications. Several "instant messaging" applications already enable communications between users of wireless devices and/or personal computers. Emerging

[1] *The foundations for this strategy can be found in NENA's "Interim SMS Text-to-9-1-1 Information and Planning Guide" at: http://c.ymcdn.com/sites/www.nena.org/resource/resmgr/Docs/SMS_Text_Info_and_Planning.pdf .*

"apps" also attempt to 'enhance' the ability to call or interact with 911 by providing a variety of targeted public safety related features (such as data about the caller and/or the caller's location, etc.). These apps run on their own "back-end" services and ride "over the top" of the carriers' wireless networks, and therefore outside of the carrier's ability to route the traffic to 911 through mechanisms established for text-to-911. Public pressure to implement these apps already exists, and will grow over the 10-year planning horizon.

Again, the E911 Program Office must monitor technological progress and adopt standards, technologies, and policies in a timely manner to stay current with industry standards. "Over-the-top" upgrades are estimated for 2023 or beyond. (Details appear in Appendix B.)

B. **Evolution of Standards** – Monitor the pace of standards development and vendor adoption to establish maturity, viability and supportability of new features.

C. **Decision Criteria** – Develop decision criteria to weigh the benefits of new features with their operational and fiscal impacts, and to determine the phasing of deployment. [During SP process]

D. **Implementation Timeline** – Establish a roadmap and timeline for the implementation of features across the region-wide 911 system. [Who makes decisions?]

Metrics & targets for this Objective have not yet been formulated, but the example timeline below shows potential sequencing of the features discussed above. This is a starting point for further discussion and analysis and should not be viewed as the final recommendations of the Technology and Operations Taskforce.

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
NG9-1-1 Features Evolution Estimates										
Interim Text-to-911										
Migration to full ESInet Transport										
Processes in place to allow Photo attachments										
Transition to allowing Video attachments										
Fully interactive Text/Photo/Video										
Telematic data to 9-1-1 and thru to first responders										
Integration of OTT Applications into i3 9-1-1 architecture										

*NG911 Readiness Objective #3 – **Identify NG911 Functions***

The E911 Program Office will identify a group of NG911 functions, most of which are characteristics of how the ESInet II will function, that will improve call delivery and capabilities in partnership with the PSAPs.
(Goals: Meet or Exceed Industry Standards; Equity; Seamless System-wide Technology.)

The following **Actions** will be taken:

A. **NG911 Functions** – Deploy NG911 functions with the greatest customer and operational benefit. These include ESInet II; geospatial routing; session initiated protocol (SIP) call transport; call security; routing policies; additional data repository (ADP) functionality; location information; and agency locator support. These are summarized below, and discussed in more detail in Appendix C.

Complete Transition of PSAPs to ESInet II – Once ESInet II is fully operational, the PSAPs will migrate operations to it. Expected completion: 3rd Quarter 2018.

Complete Transition of Carriers to ESInet II Connectivity – Once the PSAPs are transitioned to ESInet II, testing and migration will continue with the telecommunications carriers. Expected completion: 2nd Quarter 2019.

Evolution of Call Routing to Geospatial Routing – The end state of the NENA i3 architecture is for call routing to be based on the geo-coordinates of each call to 911. This requires that the geo-coordinate of each call be identified **and** then routed based on these geo-coordinates. This requires the wireline and VoIP carrier community to move away from tabular call routing to geospatial routing technologies. It also requires that the ESInet II's geographic information system (GIS) data be highly accurate and up-to-date. Until all the statewide GIS data is ready for transition to geospatial routing (perhaps late 2019), an Automatic Location Information (ALI) database will support call routing. For the E911 Program Office, this means close coordination with the State to ensure a timely and seamless transition.

Conversion to NENA i3 SIP Call Transport – The end state of the NENA i3 architecture is for call traffic entering, transiting and exiting the ESInet to conform to Session Initiated Protocol (SIP) standards. This means that telecommunications carriers and PSAPs will need to transition their equipment to support these protocols. Expected: 2nd Quarter 2019.

Security throughout ESInet II and CPE/Workstation pathway – Since the NENA i3 architecture is founded on internet protocol networking, routing and security principles, robust network security is required – beginning at the point of ingress from the carriers all the way through to the point of egress at the call receiving workstation. This requires security systems, policies, personnel and processes at the State, County, and PSAPs. Ongoing throughout the 10-year planning period.

Enhanced Routing Policies – NENA i3 architecture will allow creation of IP Routing rules to provide increased flexibility on how calls get routed to an alternate PSAP if the Primary PSAP isn't available. This enables interagency agreements between PSAPs to provide backup or surge capacity. Likely implemented: 2018-19.

Additional Data Repository (ADR) – The ADR database will allow caller information (such as pre-existing medical information, specific location, or routing information, etc.) to be stored so that it can be retrieved by a PSAP receiving a 911 call from a specific caller. Likely implemented: 2018-19.

Location information – Within the NENA i3 architecture, 911 calls from wireline and static VoIP devices will query the Location Information Server (LIS) to determine the location of the caller and pass this information to the PSAP. This replaces the current Automatic Location Information (ALI) database. This capability won't be available until all carriers complete their transition to fulling conforming NENA i3 call delivery.

Agency Locator Support – The NENA i3 architecture identifies many data elements that are logged as a part of the call flow. Each logged element creates an "Agency Locator Record" that can be queried by the PSAPs if needed. This capability will be in place with ESInet II deployment in early 2018, but the degree to which the data will be used by the PSAPs will depend on their full migration to a NENA i3 compatible interfacing with ESInet II. Likely: 2018-19.

B. **Pace of Standards** – Monitor the pace of standards development and vendor adoption to establish maturity, viability and supportability of new features

C. **Implementation Timeline** – Develop a decision and implementation timeline for these functions that aligns with progress of ESInet II and the King County E-911 system. [Who makes decisions?]

Metrics & targets for this Objective have not been identified, but the sample timeline below shows potential sequencing of the functions discussed above. This is a starting point for further discussion and analysis and should not be viewed as the final recommendations of the Technology and Operations Taskforce.

NG9-1-1 Function Evolution Estimates	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Complete Transition of PSAPs to ESInet Connectivity										
Complete Transition of Carriers to ESInet Connectivity										
Evolution to Geospatial Call Routing										
Full Conversion to NENA i3 SIP Call Transport										
Fully Developed End-to-End Security										
Implementation of the Policy Routing Function										
Implementation of ADR Functionality										
Implementation of Location Information with Calls										
Agency Locator Support										

*NG911 Readiness Objective #4 – **Evaluate and Adopt a System Architecture***

The E911 Program Office, working with regional partners will identify an overall system architecture for NG911 capable telephone systems and networking to allow PSAPs to effectively access and utilize the selected NG911 Features and Functions.
(Goals: Meet or Exceed Industry Standards; Seamless System-wide Technology; Secure, Resilient and Survivable.)

The following **Actions** will be followed:

A. **Identify Options** – Review architectural options for maximum interoperable efficiency, with the desired Features and Functions, and an ability to phase into NG911 over next 10 years. This is done. The options are listed here (with diagrams in Appendix D):

   Option 1: Decentralized – Continue the current decentralized system architecture with each PSAP equipped with NG911 system equipment and directly interfaced to ESInet II.

   Option 2: Single Platform – Pursue a Single Platform strategy with a single NG911 system core, geo-diverse nodes, and diverse communications networks to NG911 workstations at all PSAPs.

   Option 3: Dual Platform – Pursue a Dual Platform strategy, both with geo-diverse nodes and diverse communication networks to all PSAPs

B. **Review Options on Functionality** – Review architecture options from reliability, supportability and survivability perspectives, as well as the Architectural Principles. In progress. Done by May.

C. **Review Options on Financial Criteria** – Coordinate with Finance Task Force to assess financial/resource impacts of each architectural option. Timing?

Measurements relative to these Strategies have not yet been formulated, but will include a timeline for assessment of architectural options, a timeline for making decisions on any architectural changes, and a timeline for implementing any architectural changes. [Doesn't this need to be complete during Strategic Planning? Who makes the decision?]

Integrated and Interoperable Systems

Ensuring systems are integrated effectively to achieve reliable interoperability across organizations and functions in delivering seamless 911 services region-wide.

Current State and In-Progress Initiatives

There are several in-progress initiatives, or aspects of the current environment, that serve as a baseline for this category:

- The State of Washington's deployment of ESInet II.
- The capabilities of the current or soon-to-be refreshed PSAP equipment relative to the features and functions becoming available across the ESInet II.
- Existing operational strategies utilized by the PSAPs with overlapping responsibilities between law enforcement dispatching and Fire/EMS dispatching.
- Existing backup and or interoperability relationships and technology capabilities that may already be established between the PSAPs.

*Integrated and Interoperable Objective #1 – **Identify Interoperability Features***

The E911 Program Office in partnership with PSAPs will identify a group of interoperability features for consideration and adoption during the 10-year Strategic Plan timeframe. These features may include characteristics such as survivability, geographic and carrier diversity, high availability, and resiliency.
(Goals: Meet or Exceed Industry Standards, Seamless System-wide Technology; Secure, Resilient and Survivable.)

The following **Actions** will be taken:

A. **Identify Options** – Work with internal and external industry experts to identify and understand:
   - **Carrier Diversity** – Current carrier capabilities and potential for carrier diversity, regardless of the overall architecture selected for King County.
   - **High Availability** – Identifying effective practices to achieve a highly available, resilient and diverse system across all the PSAPs in King County.
   - **Survivability** – Working within existing or future Memorandums of Agreement (MOAs) with other agencies, potentially outside of the region, for developing a continuity of operations plan bolstering survivability from ESInet II.
   - **Virtual PSAPs** – Exploration of Virtual PSAP capabilities to allow platform-based architectures to be expanded to create PSAP capabilities at locations other than established PSAPs.
   - **Mobile PSAPs** – Exploration of Mobile PSAP capabilities to allow temporary or tactical PSAPs to be established to support unique circumstances
   - **Real-time Data Capture** – Real-time monitoring and baseline data capture (for example to adapt to surges in call volumes)

B. **Pace of Standards** – Monitor pace of standard development and vendor adoption to establish maturity, viability and supportability of new features

C. **Implementation Timeline** – Develop a decision and implementation timeline for these features. [Who makes decisions?]

Measurements relative to these Actions have not yet been formulated, but will include a roadmap for implementation of the desired Interoperability Features. [When? Who decides?]

*Integrated and Interoperable Objective #2 – **Identify Interoperability Functions***

The E911 Program Office working in partnership with PSAPs will identify interoperability Functions (mostly characteristics of how the ESInet II will function) that will improve call delivery and capabilities at the PSAPs.
(Goals: Meet or Exceed Industry Standards; Seamless System-wide Technology; Secure, Resilient and Survivable.)

The following **Actions** will be taken:

A. Work with internal and external industry experts to identify and understand:
   - **Existing Structure** – How PSAPs are currently interconnected (both from a 911 context and across other systems/networks) and highlight processes that work well and need to be sustained or processes that are candidates for improvement.
   - **PSAP Needs** – Needs of each PSAP for interoperability to their respective backup PSAP.
   - **Bottlenecks** – Network bottlenecks, busy signal data, and current roll-over capabilities.
   - **Potential Efficiencies** – Potential for Class of Service or other trunking efficiencies.
   - **Routing Protocols** – Evolving routing protocols within the ESInet.
   - **Data Protocols** – Explore further use of interoperable data protocols (EIDD, XML, etc.) between PSAP systems.

B. **Pace of Standards** – Monitor the pace of standards development and vendor adoption to establish maturity, viability and supportability of new features

C. **Implementation Timeline** – Develop an implementation timeline for these Functions that correlates to the progress of the State ESInet and the features required or desired across the King County PSAPs. [Who makes decisions?]

Security and Resiliency

Protecting the 911 call flow, beginning at the State's ESInet, continuing through the various systems and transport mechanisms, and arriving at the PSAPs, while also ensuring the overall resiliency of the E911 systems and operations.

Current State and In-Progress Initiatives

There are several in-progress initiatives, or aspects of the current environment, that serve as a baseline for this Strategic Category:

- Currently, the E911 Program does not have a visible way to track security vulnerabilities, which puts the system at risk. A Security Risk Assessment process is underway during 2017.
- Expectations and awareness regarding the security policies and procedures that should be adhered to are not standardized within the E911 Program Office. This includes the lack of a

formalized security awareness and training program and sporadic application of system and network patches and security releases.

- Vendors are not held accountable to regular security audits and contract language needs to be standardized and improved to increase vendor accountability for implementing and adhering to industry, State and E911 Program Office security standards.
- Routine upgrades, patches and version upgrades are currently underway on various networking components, in addition to the previously mentioned VIPER telephone systems refreshes.

*Security and Resiliency Objective #1 – **Security Standards***

The E911 Program Office will identify, understand and apply security standards and practices, including King County Security and Privacy policies, that align across the 911 industry, the ESInet II, and the requirements of King County and the PSAPs. This strategy maps to the Planning Goals of Meeting or Exceeding Industry Standards and achieving a Secure, Resilient and Survivable 911 environment.

The following **Actions** will be taken:

A. **Staffing & Funding** – Ensure appropriate level of staffing and funding is in place to continually meet the security objectives of the E911 standards requirements.

B. **Certification Process** – Establish mechanisms so that personnel working with security issues for the regional E911 phone system can complete an industry approved security certification process. Identify the approved security certificate program by 1Q 2018 and have 25 individuals take the training and earn the certificate in 2018. The training will be available in subsequent years for new hires and those who are yet to take the training, as well as personnel that want to refresh or renew their certificates.

C. **Security Awareness Training** – Establish an annual security awareness training for appropriate E911 Program Office staff.

Measurements: All E911 Program and PSAP staff will be required to take security awareness training on a yearly basis to stay current on the security policies and standards that apply to their job functions. The target will be 75% of staff trained in 2018, 85% of staff trained in 2019, and 100% of staff trained in 2020 and beyond.

*Security and Resiliency Objective #2 – **Security Program***

The E911 Program Office will develop an E911 security program that is aligned and integrated with the King County Information Assurance / IT Security Program to ensure that security policies, awareness and practices are understood and integrated into components of the E911 program. This will also ensure data and security roles and responsibilities as described by the NENA security standards are assigned and understood.
(Goals: Meet or Exceed Industry Standards; Secure, Resilient and Survivable.)

The following **Actions** will be taken:

A. **Security Policies** – Establish E911 security policies and practices with PSAPs that clearly articulate expectations and roles and responsibilities between the E911 Program Office and PSAPs and King County Information Assurance policies, in adherence to KC IT Security Program, established IT security best practices and 911 security standards.

B. **Staffing & Funding** – Ensure appropriate level of staffing and funding is in place to continually meet the security objectives of the E911 standards requirements.

Measurements: A security governance structure has been developed and documented. The E911 Program Office and PSAP staff are engaged in the governance structure and in meetings. The target will be to develop the governance structure in 1Q 2018 so that it can be informed by the current E911 Strategic Planning Group and the Governance Task Force.

*Security and Resiliency Objective #3 – **Operations and Architecture***

Continue to enhance system resiliency. Focus on reliability (ability to handle expected load); redundancy (eliminate single points of failure), and diversity (minimize overreliance on single providers, vendors, or equipment). The system architecture should also optimize the availability of PSAPs to serve as backup(s) to other PSAPs.
(Goals: Meet or Exceed Industry Standards; Secure, Resilient and Survivable; No Request Lost.)

The following **Action** will be taken:

A. **Implement IT Best Practices** – Implement IT operational best practices to mitigate security risks including the disciplines of asset management, change management, problem diagnostics and management, incident management, patch management / software and hardware upgrades, and lifecycle management

Measurements: Implement a process at the E911 Program Office to measure and report key performance: availability, blocked calls (not able to be delivered to the PSAP), calls in the queue (ESInet II), dropped calls, unanswered calls, calls answered, calls dispatched, type of call (landline, cell, VoIP, text). [Timing?]

*Security and Resiliency Objective #4 – **Vendor Management***

Standardize the vendor selection and on-going monitoring processes by developing standard business and technical specifications, service level agreement (SLA) requirements that can easily be measured, and accountability language with appropriate penalties for non-compliance. Require the E911 Program Office to conduct and require security or technical audits on a regular basis as required by NENA and State standards.
(Goals: Meet or Exceed Industry Standards; Secure, Resilient and Survivable; No Request Lost.)

The following **Actions** will be taken:

A. **Vendor Management Best Practices** – Ensure vendor management best practices are followed to minimize risks of failure from mission critical vendors and service providers.

B. **Quarterly Reports** – Require quarterly reports from E911 Program Office vendors on performance against the contract SLAs and analyze vendor performance over time to spot emerging adverse trends.

Measurements: Standard security requirements and language are developed in coordination with KCIT Information Assurance and contracts staff, PSAP staff, and E911 Program Office staff. The target is to include the standard language in new vendor contracts and RFPs developed by the E911 Program Office and/or developed in partnership with PSAPs. [Timing?]

Optimized Operations

Providing reliable 911 services across King County that meet or exceed applicable standards by providing a combination of hardware and software systems, databases, networking and operational support that accurately locate and route calls to King County PSAPs delivered from the State ESInet

Current State and In-Progress Initiatives

There are several in-progress initiatives, or aspects of the current environment, that serve as a baseline for this Strategic Category:

- The current decentralized system architecture of VIPER telephone systems in each of the PSAPs is undergoing a refreshment process, with the larger PSAPs recently completed and the smaller PSAPs still to be completed.
- Additional projects are underway to enhance current networking to each of the PSAPs for non-911 data connectivity needs (such as retrieving operational statistics from the VIPER systems).
- Ongoing coordination with the State is underway to plan and execute the migration of the PSAPs to ESInet II once its deployment and testing are complete and other PSAPs around the State with similar VIPER telephone system equipment have undergone successful migrations.
- An interim solution is being implemented to provide Text-to-911 capabilities until full NG911 Features and Functions are enabled through ESInet II.
- The E911 Program Office is currently undergoing an organizational transition from the Office of Emergency Management to King County Information Technology (KCIT).

*Optimized Operations Objective #1 – **Standards and Policies***

Define and develop standards and policies that clearly define the roles and responsibilities of the E911 Program Office and the PSAPs for the current decentralized system architecture, and adapt these standards and policies as needed if the system architecture undergoes any changes.

(Goals: Meet or Exceed Industry Standards; Secure, Resilient and Survivable; Seamless System-wide Technology.)

The following **Actions** will be taken:

A. **Demarcation Points** – Define the appropriate demarcations between the E911 Program Office and the PSAPs, and between the E911 Program Office and the State 911 Program, for each individual technology system or operational responsibility so that clear responsibility and accountability paths are established.

B. **Standards & Policies** – Develop standards and policies that are consistent with over-arching NENA i3 and related standards and tailored to the unique needs of King County and the PSAPs.

C. **Governance** – Formulate, review and adopt standards and policies through a governance process that result in cost efficiencies or affirm the core mission and goals of the E911 Program.

Measurements: Achievement of these Strategies will be measured by the successful creation of these standards and policies, and the routine review of E911 Program Office and PSAPs conformance to them. [Timing?]

*Optimized Operations Objective #2 – **Delivery Framework***

Establish a delivery framework that imposes appropriate governance and controls on both project and change management workloads.
(Goals: Meet or Exceed Industry Standards; Secure, Resilient and Survivable; Seamless System-wide Technology.)

The following **Actions** will be taken:

C. **KCIT Delivery Framework** – Adapt current KCIT delivery framework strategies to the responsibilities of the E911 Program Office.

D. **Project Management Standards** – Implement industry standard program and project management techniques, such as those defined by the Project Management Institute (PMI) for their Project Management Professional (PMP) certification or from the Praxis Framework established by the Association for Project Management.

Measurements: Achievement of these Strategies will be measured by adoption these delivery frameworks. Underway.

*Optimized Operations Objective #3 – **Operational Framework***

Establish an operational framework based on the Operational IT Infrastructure Library (ITIL) model that clearly defines and governs operational, maintenance, and forward-looking workloads.
(Goals: Meet or Exceed Industry Standards; Secure, Resilient and Survivable; Seamless System-wide Technology.)

The following **Actions** will be taken:

C. **KCIT Operational Framework** – Adapt current KCIT operational framework strategies to the responsibilities of the E911 Program Office.

D. **Problem Management** – Implement change control, major incident processes, and problem management disciplines consistent with existing KCIT practice and adapted to E911 Program Office responsibilities.

Measurements: Achievement of these Strategies will be measured by adoption and use of these frameworks. [Timing?]

*Optimized Operations Objective #4 – **Business Continuity Management***

Establish a Business Continuity Management (BCM) strategy that delineates between E911 Program Office BCM responsibilities and PSAP BCM responsibilities, and establishes both technical and non-technical response solutions. This strategy maps to the Planning Goals of Meeting or Exceeding Industry Standards and achieving a Secure, Resilient and Survivable 911 environment.

The following **Actions** will be taken:

A. **KCIT Business Continuity Management** – Adapt current KCIT BCM methodologies to the E911 Program Office.

B. **KCIT Coordination** – Coordinate overall BCM planning within the context of the Actions already identified related to NG911 Readiness, establishing Integrated and Interoperable systems, and any architectural changes to the overall NG911 environment in King County.

Measurements: Achievement of these Strategies will be measured by the adoption and use of BCM strategies. [Timing?]

Optimized Operations Objective #5 – Call Routing and Delivery

Establish a process for determining the appropriate routing of calls to PSAPs that takes into consideration the capacities and capabilities of the PSAPs receiving those calls.
(Goals: Prompt Response; No Request Lost; Seamless System-wide Technology.)

The following **Actions** will be taken:

C. **Routing Criteria** – Establish mutually agreeable criteria with the PSAPs for determining how routing decisions are made, particularly for the ever-changing world of cell site additions or coverage changes by multiple wireless carriers.

D. **Periodic Review** – Periodically review and adjust the routing criteria to make sure they remain consistent with PSAP operational needs, capacities and capabilities.

Measurements: Achievement of these Strategies will be measured by the successful creation and utilization of these call routing strategies. [Timing?]

Accessible and Equitable Service

Increasing equitable access to the 911 services for all communities and individuals served, with specific focus on lessening obstacles faced by groups with unique needs.

Current State and In-Progress Initiatives

There are several in-progress initiatives, or aspects of the current environment, that serve as a baseline for this Strategic Category:

- The E911 Program Office conducts an ongoing body of public education and outreach related to the proper use of 911. This includes topics such as educating youth, an accidental call campaign, and multicultural campaign.
- The Program Office also develops and distributes a variety of 911 educational material that is used by local public safety agencies in their public education and outreach programs.
- The Program Office currently has master contracts in place with three separate language interpretation services. These services are used by the PSAPs to handle 911 calls from non-English speaking callers. Currently each year approximately 10,000 911 calls in King County require the use of language translation, with over 50 languages being utilized.
- King County does not currently have text-to-911 capability, and the E911 Program Office is engaged in an interim solution to deploy text-to-911 capability at each of the PSAPs in King County. Once completed, the E911 Program Office will need to engage in further planning activities with the State and the current 911 telephone system equipment vendor to determine if a full set of NENA i3 Features and Functions (described in the NG911 Readiness section) can be accomplished through ESInet II.

*Accessible and Equitable Service Objective #1 – **Public Education and Awareness***

The E911 Program will improve public understanding of the purpose of 911 and how it works. *(Goals: Prompt Response; No Requests Lost; Equity.)*

The following **Actions** will be taken:

A. Public Education & Outreach – The King County E911 Program Office will sustain its public education and outreach efforts, in close coordination with the PSAPs. [Is this consistent with Kathy's current Core Services Presentation?]

B. **Expand Awareness** – As needed and informed by outreach to various special needs communities (currently underway and concluding in April 2017), additional programs will be developed to expand the awareness of 911 services across the county.

C. **Relationships** – Relationships with organizations from the deaf and non-English speaking communities will be created and maintained.

Measurements: As further outreach is conducted with various special needs communities, specific measures will be developed. [Timing?]

*Accessible and Equitable Service Objective #2 – **Reducing Barriers for non-English Speakers***

The E911 Program will continue to improve the accessibility to 911 services for non-English speakers, remove barriers when possible and monitor the performance of interpretation contractors. This strategy maps to the Planning Goals of providing Prompt Response to 911 calls, assuring No Requests are Lost during initial call receiving or subsequent transfers to other PSAPs, and providing Equity in access to 911.

The following **Actions** will be taken:

A. **Performance Measures** – Develop performance measures in vendor contracts and monitor them against performance.

B. **RFP Development** – Engage PSAPS in the development of language services RFPs and the scoring and selection of contractors.

C. **Multiple Vendors** – Maintain a multi-vendor environment to provide language interpretation services.

Measurements: To evaluate translation services effectiveness, the E911 Program will:

- Conduct an annual tabulation of calls to 911 that utilize translation services.
- Evaluate vendor performance against contract requirements and/or service level agreements.
- Other measures may be developed after the community outreach process. [Timing?]

*Accessible and Equitable Service Objective #3 – **Modernizing Technology***

Modernize technology to eliminate barriers for the deaf community in accessing 911 services. This strategy maps to the Planning Goals of providing Prompt Response to 911 calls, assuring No Requests are Lost during initial call receiving or subsequent transfers to other PSAPs, creating a Seamless System-wide Technology, and providing Equity in access to 911.

The following **Actions** will be taken:

A. **Interim text-to-911** – The King County E911 Program Office will continue and complete the current text-to-911 project so that all PSAPs in King County have access to this functionality.

B. **Text-to-911 Evolution** – Since King County will be deploying an "interim approach" for providing text-to-911 capability, further planning with the current CPE vendor and the State ESInet will be needed to determine if native NENA i3 texting can be implemented directly through the latest version of ESInet.

C. **Up-to-Date Technologies** – King County 911 will include up to date technologies as long as budgets allow, including: text-to-911 and future enhancements such as Real Time Text (RTT) and Multimedia Messaging Emergency Services (MMES) into planning activities for CPE upgrades or system architecture changes.

Measurements: As further outreach is conducted with various special needs communities, specific measures will be developed. [Timing?]

Appendix A

First Draft Technology and Operations Strategies Matrix

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
NG911 Ready Preparing for the emerging capabilities of NG911 (text, photos, video, telematics, etc.) with a roadmap that adopts and adapts to technology changes, and that balances operational needs with improved service and cost effectiveness.	Standards King County will only pursue technology investments that are consistent with the NENA i3 framework and compatible with the ESInet being deployed by the State of Washington.	1. Monitor NENA i3 standards (NENA-STA-010.2-2016) to guide decisions on technologies and service providers. 2. Monitor NENA Network & Interoperability Standards (03-004; 03-503; 03-506) to achieve compliance and guide future architectural decisions. 3. Monitor Washington ESInet standards and guidelines, such as E911 and NG911 Systems and Network Infrastructure and Security Standards for Washington State Public Safety Answering Points, to guide integration efforts and future decisions.	TBD

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
Team: • Chelo Picardal (Bellevue) • Kenn Moisey (WA State – ESInet) • Tim Osgood (Woodinville F&R) • Jess Nelson (ValleyCom) • Kevin Kearns (IXP) Applicable Regulations or Standards: NENA Detailed Functional and Interface Standards for NENA i3 Solution (NENA-STA-010.2-2016, 06/10/2016)	Features – NG911 King County will identify a group of NG911 Features for consideration and adoption during the 10-year Strategic Plan timeframe. These Features are NG911 capabilities that the PSAPs would use in a hands-on manner in handling 911 interactions with the calling public.	1. Pursue NG911 features that has greatest customer and operational benefit. Potential phasing in of new features: • Text-to-911: Interim text-to-911 in near-term transitioning to end to end text-to-911 integrated in ESInet within 2 years and eventually Real Time Text (RTT) beyond 3 years • Photos: ability to attach photos to text messages • Video call: ability to interact with PSAPs via video • Videos: ability to attach videos to text messages • Telematics: ability to receive data from telematics services for vehicle collisions • Over-the-top (OTT) apps: support select apps that enhance 911 calls or target specific capabilities. 2. Monitor pace of standard development and vendor adoption to establish maturity, viability and supportability of new features 3. Use governance process being established to understand benefits of any new feature, weigh operational and fiscal	Develop NG911 Features Roadmap by XXX date

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
		impacts, develop decision criteria and decide phasing of deployment. 4. Develop Features Roadmap. 5. Monitor emergence of OTT apps and establish clear decision criteria that align with E911 and PSAPs essential missions and considers long-term sustainability	

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
	Functions – NG911 King County will identify a group of NG911 Functions, most of which are characteristics of how the ESInet will function, that will improve call delivery and capabilities at the PSAPs.	1. Deploy NG911 functions that has greatest customer and operational benefit. Potential phasing: • Complete PSAPs migration to ESInet II (2018) • Complete transition of all carriers to ESInet II (2019) • Transition call routing capabilities to geospatial-based routing. Requires high accuracy of ESInet's GIS data. • Fully support session initiated protocol (SIP) standards end-to-end throughout the ESInet and PSAP CPE environment (2019) • End-to-end security from ESInet to customer premise equipment to call-receiving workstation • Implement policy-based routing for alternate routing based on capacity needs • Consider implementing capabilities such as additional data repository (ADR) to allow additional information (e.g., pre-existing medical information) about caller 2. Monitor pace of standard development and vendor adoption to establish	Develop NG911 Functions Roadmap by XXX date

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
		maturity, viability and supportability of new function 3. Develop Functions Roadmap	

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
	Architecture King County will identify an overall system architecture for the PSAP Customer Premise Equipment (CPE) and inter-PSAP networking to allow King County PSAPs to effectively access and utilize the identified Features and Functions.	A. Review architectural options for maximum interoperable efficiency, while encompassing the desired Features and Functions, and an ability to phase NG911 over next 10 years. • Option 1: Continue current decentralized architecture with 911 telephone systems at each of the 12 PSAPs and the current redundant communications networks • Option 2: Single Platform strategy with single 911 telephone system with geo-diverse nodes and with diverse communications networks to all PSAPs • Option 3: Dual Platform strategy, both with geo-diverse nodes and diverse communication networks to all PSAPs B. Review architecture options from reliability, supportability and survivability perspectives. C. Coordinate with Finance Task Force to assess financial/resource impacts of each architectural option.	Assessment of Architectural Options by XXX date Decision on Future Architecture by XXX date

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
Integrated and Interoperable Ensuring systems are integrated effectively to achieve reliable interoperability across organizations and functions in delivering seamless 911 services across the region. Team: • Russ St. Meyers (Seattle PD) • Jess Nelson (ValleyCom) • Jessica Sullivan/Ken Rhodes (KCSO) • Kevin Kearns (IXP) Applicable Regulations or Standards:	Features – Interoperability King County will identify a group of Interoperability Features for consideration and adoption during the 10-year Strategic Plan timeframe. These Features may include: survivability, geographic and carrier diversity, high availability, and resiliency.	1. Work with internal and external industry experts to identify and understand: • Current carrier capabilities and potential for carrier diversity • Best practices to achieve a highly available, resilient and diverse system • Existing or future MOAs with other agencies, potentially outside of the region, for developing a continuity of operations plan bolstering survivability from the State ESInet • Virtual PSAP capabilities • Mobile PSAP capabilities • Real-time monitoring and baseline data capture (for example to adapt to surges in call volumes) 2. Monitor pace of standard development and vendor adoption to establish maturity, viability and supportability of new features 3. Develop Features Roadmap.	Develop Interoperability Features Roadmap by XXX date

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
NENA Detailed Functional and Interface Standards for NENA i3 Solution (NENA-STA-010.2-2016, 06/10/2016)			
	Functions - Interoperability King County will identify a group of Interoperability Functions, most of which are characteristics of how the ESInet will function, that will improve call delivery and capabilities at the PSAPs.	D. Work with internal and external industry experts to Identify and understand: • How PSAPs are currently interconnected and highlight processes that work well and processes that do not or which can be improved. • Needs of each PSAP for interoperability to their respective backup PSAP. • Network bottlenecks, busy signal data and current roll-over capabilities • Potential for Class of Service and other trunking efficiencies	Develop Interoperability Functions Roadmap by XXX date

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
		• Evolving routing protocols (ECRF, LIS, etc.) • Interoperable data protocols (EIDD, XML, etc.) E. Monitor pace of standard development and vendor adoption to establish maturity, viability and supportability of new functions F. Develop Functions Roadmap	
Secure and Resilient E911 Protecting the 911 call flow from the State's ESInet through the E911 system and onto the PSAPs. Ensuring the resiliency of the E911 system and operations.	**Security Standards:** Understand and start to apply E911 security standards and King County Security and Privacy policies that align with the E911 systems and program and PSAP's.	1. Ensure appropriate level of staffing and funding is in place to continually meet the security objectives of the E911 standards requirements. 2. Train staff and have staff that work with security issues complete an industry approved security certification. Target would be to identify the approved security certificate program by 1Q 2018 and have 25 staff in the E911 program and PSAP's take the training in 2018 and earn the certificate. The training will be available in subsequent years for new staff that qualify to take the training, additional staff that did not take the	All E911 program and PSAP staff are required to take security awareness training on a yearly basis to stay current on the security policies and standards and review any changes or additions to the policies and standards. The target will be 75% of staff in the first year, 85% of staff in the second

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
Team: Bill Kehoe (KC) Ralph Johnson (KC) Dee Hathaway (NORCOM) Nathan Way (NORCOM) Kevin Kearns (IXP)		training in earlier years, and staff that want to refresh or renew their certificate.	year, and 100% of staff in the third year.
Applicable Regulations or Standards: State of Washington PSAP System and Network Security Standards (Published 09/18/2014)	**Security Program:** Develop an E911 security program that is aligned and integrated with the King County Information Assurance / IT Security Program to ensure that security policies, awareness and practices are understood and integrated into all components of the E911 program. Ensure data and security roles and responsibilities as	Establish E911 security policies and practices with PSAPs that clearly articulates expectations and roles and responsibilities between E911 Program and PSAPs and King County Information Assurance policies, in adherence to KC IT Security Program, established IT security best practices and 911 security standards.	A security governance structure has been developed and documented. The E911 program and PSAP staff are engaged in the governance structure and in meetings. The target will be to develop the governance structure in 1Q 2018 so that it can be informed by the current E911 Strategic Planning group and the

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
NENA Security for NG911 Standard (NENA 75-001, 02/06/2010 NENA NG911 Security Audit Checklist (NENA 75-502, 12/15/2011	described by the NENA security standards are assigned and understood.		Governance sub-committee.

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
FCC Task Force on Optimal PSAP Architecture (published 01/29/2016)	**Operations and Architecture:** Continue to enhance resiliency with focus on reliability of systems (able to handle expected load), increasing redundancy (e.g., eliminating single points of failure), and increasing diversity (e.g., minimize overreliance on single providers, vendors or equipment). The architecture of the system should optimize availability (i.e. the ability for a PSAP(s) to serve as a backup to other PSAP's).	Implement IT operational best practices to mitigate security risks including the disciplines of asset management, change management, problem management, incident management, patch management / software and hardware upgrades, and lifecycle management.	Implement a E911 Tier 4 board at the E911 center and begin to measure and report key performance: availability, blocked calls (not able to be delivered to the PSAP), calls in the queue (ESInet), dropped calls, unanswered calls, calls answered, calls dispatched, type of call (landline, cell, VoIP, text).

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
	Vendor Contract Management: Standardize the Vendor selection and on-going monitoring processes by developing standard business and technical specifications, SLA requirements that can easily be measured, and accountability language with appropriate penalties for non-compliance. Require the E911 program to conduct and require security or technical audits on a regular basis as required by NENA and State standards.	Ensure vendor management best practices are followed to minimize risks of failure from mission critical vendors and service providers. Require quarterly reports from all E911 program vendors on performance against the contract SLA's. Audit requirements.	Standard security requirements and language are developed in coordination with KCIT Information Assurance and contracts staff, PSAP staff, and E911 program staff. The target is to include the standard language in all new vendor contracts and RFP's developed by the E911 Program Office and the PSAP's.
Accessible and Equitable Service Increasing equitable access to the E-911 service for all communities and individuals served, with	The E911 Program Office will improve public understanding of the purpose of the E911 program and how it works.	1. The King County E911 Program Office will sustain its public education and outreach efforts, in close coordination with the PSAPs. 2. As needed and informed by committee outreach to various special needs communities, additional programs will be	As further outreach by the committee is conducted with various special needs communities, specific measures will be developed.

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
specific focus on lessening obstacles faced by specific groups. Team: Krista Camenzind (KC) Kellie Shapard (ADWAS Andres Mantilla (CBE) Kate Nolan (CBE) Kathy Lombardo (KC) Kathy Pitarys (KC) Meg Goldman (KC) Kevin Kearns (IXP)		developed to expand the awareness of 911 services across the county. 3. Relationships with organizations from the deaf and non-English speaking communities will be created and maintained.	
	The E911 Program Office will ensure there are no barriers to non-English speakers who call 911. (Further discussion will be conducted on whether 'no barriers' is achievable)	1. Develop performance measures in vendor contracts and monitor them against performance. 2. Engage PSAPS in the development of translation RFPs and the scoring and selection of contractors. 3. Maintain multi-vendor environment to provide language interpretation services.	1. Annual tabulation of calls to 911 in languages other than English. 2. Evaluate vendor performance against contract requirements and/or service level agreements. 3. Others as identified through the community outreach process.
	Modernize technology to eliminate barriers for the deaf community in accessing the 911 system.	1. The King County E911 Program Office will continue and complete the current text-to-911 project so that all PSAPs in King County have access to this functionality. 2. Since King County will be deploying an "interim approach" for providing text-to-911 capability, further planning with the current	As further outreach by the committee is conducted with various special needs communities, specific

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
		CPE vendor and the State ESInet will be needed to determine if native NENA i3 texting can be implemented directly through the latest version of ESInet. 3. King County 911 will include up to date technologies as long as budgets allow, including: text-to-911 and future enhancements such as Real Time Text (RTT) and Multimedia Messaging Emergency Services (MMES) into planning activities for CPE upgrades or system architecture changes.	measures will be developed.

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
Optimized Operations Providing reliable 911 services to King County residents that meets or exceeds standards. Delivering calls from State network to PSAPs across a network, databases, equipment and applications. Ensuring accurate call location and routing. Team: Deb Flewelling (KC) Aaron Barak (KC) Bob Potts (KC) Greg Hough (Seattle Fire) Micki Singer (Bothell PD)	**Standards/Policies:** Define & develop standards and policies that encompass both operational & maintenance activities, security, and technology.	1. Define appropriate demarcation between program & PSAPs that guide program mandated policies/standards & PSAP policies/standards. 2. Consider existing standards (other PSAPS or organizations) 3. Policies/standards should result in cost savings or affirm core program mission & goals (we are not to seek standards & policies for their own sake)	1. Transition Program office to KCIT 2. Identify/adopt/create policies & standards in partnership with relevant disciplines. 3. Review standards compliance quarterly via the TBD governance framework.
	Delivery Framework: Establish a delivery framework that imposes appropriate governance & controls on both project and change management workloads.	PMP/Praxis based framework as a guide.	1. Transition Program office to KCIT 2. Adopt existing KCIT delivery framework by EOY 2017.

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
Kevin Kearns (IXP)	**Operational IT Infrastructure Library (ITIL) based framework**: Adopt an ITIL based operational model that clearly defines & governs operational, maintenance, and forward looking workloads. Implement change control, major incident process's, and problem management disciplines.	1. ITIL v.3 framework as a guide 2. Leverage existing process's workflows where practicable.	1. Transition Program office to KCIT 2. Adopt existing KCIT ITIL Operations framework inclusive of incident, change, and problem methodologies.
	Business Continuity Management (BCM): Establish a BCM strategy that delineates between local PSAP BCM and regional BCM and establishes both technical & non-technical response postures.	1. Consider resources, technology, desired recovery time window, cost, & multiple use cases. 2. Leverage existing process's workflows where practicable.	

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
	Security Program: Establish/adopt an E911 security program that is aligned with the King County KCIT Security Office to ensure that security policies, awareness, and practices are defined and integrated into all components of the E911 program.	Establish E911 security policies and practices with PSAPs that clearly articulates expectations and roles and responsibilities between E911 Program and PSAPs and King County Information Assurance policies, in adherence to KC IT Security Program, established IT security controls and 911 security standards.	A security Governance structure for the E911 program has been documented and approved and E911 is participating in the King County Information Assurance security leads group.
	Governance: Implement a governance framework that encompasses vendor management disciplines, established controls adherence, and SLA/OLA performance management.	1. Document As-Is processes. 2. Develop service catalogue and appropriate Service Level and Operating Level agreements. 3. Develop Vendor Management guidelines to address vendor relationship management, performance management and risk management. 4. Develop Asset Management guidelines and reporting	

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
	Financial: Establish a financial plan and policy that supports the core mission of the regional E911 program, facilitates transparency of expenditures, and provides adequate forecasting to enable the E911 regional program & partners to adequately plan for future events & needs.	Develop: 1. Policies governing revenue spend. 2. Guidelines for project budget reporting and forecasting. 3. Forecast and trend reporting.	
	Call Delivery: When feasible, facilitate calls to 911 to be routed directly to the most appropriate PSAP	Develop policies/guidelines for call routing.	
	Architecture Review: Adopt an architecture review process that will facilitate and govern existing and future technologies for all appropriate technology design elements with the	1. The Open Group Architecture Framework (TOGAF) architecture framework as a base. 2. Include subject matter level technical expertise in key technical domains that relate to security, infrastructure, core business, and applications.	

Strategic Category	Strategic Objectives (WHAT)	Technology Strategies (HOW)	Objective Measures
	aim of promoting the full leveraging of current & future E911 technologies.		

Appendix B: NG11 Features

Interim Text-to-911. The ability for the public to interact with 911 via text messaging is already a King County priority, and an "interim" strategy to accomplish this is coming.[2]

The "interim" strategy is based on using the wireless carrier's short message service (SMS) text messaging services. No photos or additional material can be attached to these messages. Messages are sent through a carrier-selected Text Control Center (TCC) and then delivered to existing PSAPs either through a virtual private network (VPN) connection to their 911 telephone system equipment, typically referred to as the customer premise equipment (CPE) or through an internet connection to a stand-alone PC-based web browser application.

The State ESInet will be configured to become the pathway between the TCCs and the PSAPs, so once this network is fully deployed and operational at all PSAPs, it would become the replacement for the VPN or browser solutions as long as the PSAP's CPE is capable of handling text messages in the NENA i3 prescribed manner.

Therefore, from a strategic planning perspective for the King County setting, the potential Strategies to deal with SMS text-to-911 capability might include:

- Complete the current project to implement the "interim" strategy within the current system architecture of 12 stand-alone PSAPs, with the goal being to migrate the message transport services to the ESInet once it is fully operational.
    - This stage of texting evolution will likely be completed in early 2018.
- Perform necessary upgrades to existing CPE to prepare them for handling SMS text-to-911 from the ESInet connection.
    - This effort may take some period of time given the current number of individual PSAP CPE systems. It may also be impacted if a decision were made to evolve the King County system architecture towards one or more shared systems. Therefore, the potential timeline for this evolution may extend to 2020 or beyond.
- Migrate SMS-based text-to-911 to the ESInet transport, making this a true "NENA i3" end-to-end solution.
    - This effort may take place on a PSAP-by-PSAP basis if the current system architecture is continued, and therefore take place concurrently as the CPE is readied. It may also be deferred until all current systems, or a new shared-system architecture is fully readied. Therefore, it is likely this final transition step may not be completed until 2020 or beyond.

Evolved Text-to-911. There are two evolutionary steps coming in the ability to interact with 911 via text messaging; utilization of Multimedia Messaging Emergency Services (MMES), and utilization of Real Time Text (RTT). These technologies will allow a number of enhanced text-to-911 functions such as the embedding of photos, video or other content along with the text message flows. RTT is perceived as advantageous over SMS-based texting since it allows sender

[2] *The foundations for this strategy can be found in NENA's* Interim SMS Text-to-9-1-1 Information and Planning Guide *at: http://c.ymcdn.com/sites/www.nena.org/resource/resmgr/Docs/SMS_Text_Info_and_Planning.pdf* .

and receiver to see the text of messages appearing as the message is composed. This allows them to gain information in close to real time rather than waiting for the message to be fully composed and sent, thus improving the quality of the bi-directional exchange.

The timelines for these technologies is unclear. The Federal Communications Commission (FCC) recently released a Report & Order (FCC 16-169 Transition from TTY to Real-Time Text Technology 12/16/2016) which establishes a pathway for wireless carriers to opt to implement RTT technology as a replacement for their current obligation to provide TTY functionality servicing the deaf community over their networks. The major carriers are supportive of the R&O. and the ultimate migration to this technology may take place within the next 2 years.

Therefore, from a strategic planning perspective for the King County setting, the potential Strategies to deal with text-to-911 evolutions might include:

- Monitor and engage in the standards development processes related to the use of MMES and RTT in the 911 domain.
- Monitor the pace at which the carrier and CPE vendor communities begin to embrace these standards
- Work with the PSAPs to develop countywide policies on if, when and how enhanced text messaging will be handled at the PSAPs. This will include establishing decisions about what will and won't be done, how the decided course of action will be funded, and how to coordinate these actions across all PSAPs.
- Engage with the State in any ESInet transition planning in preparation for their ability to handle MMES and RTT traffic, including adjustments to ESInet bandwidth to PSAPs that will be handling these enhanced messages. (preliminary timeframe for this is still under development with the State's ESInet vendor)
- Work with the CPE vendor(s) supporting King County PSAPs to make sure they are prepared for these enhanced features at the PSAPs that will be handling these enhanced messages.

The potential timelines for an evolution to enhanced texting capabilities is unknown at this point in time. Once the standards are in place, it will take a period of several years for the carrier and CPE community to fully embrace and implement these standards. Further time would then be needed to roll out the operational policies and procedures on how these enhanced features would be implemented and managed.

For purposes of the King County strategic planning effort, the following evolutionary steps are envisioned:

- The most likely first enhancement would be the ability for photos to be attached to text interactions with 911. The earliest this is envisioned in the King County setting would be after the full migration to ESInet transport and capable CPE, so somewhere beyond 2019.
- This would be followed by expanding this capability to include attaching video clips to text interactions with 911. Conceptually this could materialize as an operational feature in the 2020 to 2021 timeframe.
- The final step would be fully interactive text and enhanced media interactions, where photos and video could be simultaneously transmitted along with text.

Conceptually this could materialize as an operational feature in the King County system in the 2021 to 2022 timeframe.

Telematics Services Interfaces. Within the automotive industry, there is a broad array of automatic crash notification and data available that is currently transmitted to private call centers, such as OnStar. Some in the 911 and emergency services field believe this data would be useful to either 911 centers or to responding agencies if it could be transmitted to them before arrival at the scene. The ESInet provides the most-likely pathway to effective route and transmit this data between these private call centers and the PSAPs. Further, conveyance of this data to field responders could then be 'passed through' the PSAP via either their existing wireless broadband services, or eventually through the FirstNet public safety broadband network.

There is considerable debate in the PSAP community, nationally and locally, on whether the PSAPs should even be involved in receiving and/or doing anything with this data. Some have suggested that the ESInets and PSAPs may be used purely as data-pathways for moving this data from the private call centers and responding units. There are also some in the responder community that question the need for this data in the field, particularly in situations where response times are relatively short.

Therefore, from a strategic planning perspective for the King County setting, potential Strategies to deal with telematics services might include:

- Monitor and engage in the standards development processes related to the flow of telematics data to PSAPs and response agencies.
- Work with the PSAPs and response agencies to develop countywide policies on <u>if, when and how</u> telematics data will be utilized in the King County setting.
- Engage with the State in any ESInet transition planning in preparation for their ability to handle telematics traffic, including adjustments to ESInet bandwidth to PSAPs that will be handling these enhanced messages. This would include establishing the technology and security policies involving any interfaces to wireless broadband services linking response agencies.
- Work with the CPE vendor(s) supporting King County PSAPs to make sure they are prepared for these enhanced features at the PSAPs if it is decided to utilize these services.
- Work with response agencies to establish the technology and procedural policies to deal with the ESInet-to-that will be handling these services.

From an overall timeline perspective, work on enabling the transport of telematics data to 911 and first responders is likely to take place in parallel with work on things like text, photos and video. Therefore, the potential timeline for telematics capabilities could mirror these other efforts and perhaps come faster than these efforts. Therefore, for purposes of the King County strategic planning effort, they are being estimated in the 2020 to 2022 timeframe.

Over the Top (OTT) Applications. The wireless device application domain is already populated by a number of "instant messaging" applications to enable communications between users on either wireless devices or traditional PCs. There are also emerging "apps" that attempt to 'enhance' the ability to call or interact with 911 by providing a variety of targeted public safety related features such as linking to enhanced data about the caller, providing enhanced

information about the caller's location, etc. These apps run on their own back-end services and ride "over the top" of the carriers' wireless networks, and therefore outside of the carrier's ability to route the traffic to 911 through mechanisms established for text-to-911. While the community pressure to consider implementing these apps may be several years away, it may be that within the 10-year strategic planning horizon the King County plan will need to consider these.

Therefore, from a strategic planning perspective for the King County setting potential Strategies to deal with OTT applications might include:

- Monitor and engage in the standards development processes related to the emergency of these apps and their ability to interact with 911.
- Work with the PSAPs to develop countywide policies on if, when and how these applications will be supported in the King County setting.
- Engage with the State and other Counties to establish policies on if, when and how these applications will be supported statewide.

Given the potential complexity for establishing standards and technologies to allow multiple OTT applications to interact with 911 in a cohesive manner, and the potentially intense policy debate on whether to even allow this capability, it seems likely that this evolution will not take place for several years. For purposes of the King County strategic planning effort, they are being estimated in the 2023 and beyond timeframe.

Appendix C: NG911 Functions

A. **NG911 Functions** – Deploy NG911 functions with the greatest customer and operational benefit. These include ESInet II; geospatial routing; session initiated protocol (SIP) call transport; call security; routing policies; additional data repository (ADP) functionality; location information; and agency locator support. These are summarized below, and discussed in more detail in Appendix C.

Complete Transition of all PSAPs to ESInet II – Once the new ESInet is fully deployed, tested, and operational, each of the individual PSAPs will need to go through a process of migrating to the new ESInet. This process will include testing and cutover planning with each individual PSAP, and is expected to be completed in the 3rd Quarter of 2018.

Complete Transition of all Carriers to ESInet II Connectivity – Once all the PSAPs are fully transitioned to the new ESInet, testing and migration work will continue with the carriers. This will likely not result in many (if any) noticeable impacts at the PSAPs themselves, but will involve extensive testing and coordination with the carriers. The full migration of all carriers is expected to be completed in the 2nd Quarter of 2019.

Evolution of Call Routing to Geospatial Routing – The identified end-state for the NENA i3 architecture is for all call routing to be based on the geo-coordinate of each individual call to 911. This requires that mechanisms be in place for the geo-coordinate of each call to be identified **and** an ability to then route the call based on that geo-coordinate. This will require the wireline and VoIP carrier community to move away from the use of the Master Street Address Guide (MSAG) for table-based routing lookups to establishing identified geo-coordinates for each subscriber line termination. It will also require that the ESInet's geographic information

system (GIS) data be highly accurate and up-to-date so that appropriate routing can be accomplished.

Until all the statewide GIS data is fully ready for transition to geospatial routing (which may not occur until the end of 2019, the new ESInet will establish and support an Automatic Location Information (ALI) database to support call routing. From a King County strategic planning perspective, this will mean that close coordination between King County and the State will continue to evolve so that the ESInet's GIS data sets have the levels of completeness and accuracy to allow the migration to geospatial routing.

Full conversion to NENA i3 SIP Call Transport – The identified end-state for the NENA i3 architecture is for all traffic entering, transiting and exiting the network to conform to Session Initiated Protocol (SIP) standards established in the NENA i3 model. To achieve this, carriers and PSAPs will need to undergo equipment and protocol transitions to achieve the desired end-state. Within the King County PSAPs, the CPE in use does not currently support the NENA i3 SIP interface, so ESInet traffic is converted to legacy Centralized Automatic Message Accounting (CAMA) trunks for interface to the CPE. To complete the transition to full NENA i3 SIP call transport end-to-end, King County's CPE equipment will need to undergo either upgrades or replacements to NENA i3 SIP compliant interfaces. With the full transition of carriers not expected to be completed until the 2nd Quarter of 2019 (#2 above) the conversions of King County PSAP CPE should be targeted for approximately the same timeframe.

Fully developed and deployed security through the full ESInet and CPE/Workstation pathway – Since the NENA i3 architecture is founded on IP networking, routing and security principles, a robust network security model will need to be implemented from the point of ingress into the network from the carriers all the way through to the point or egress to the Call Receiving Workstation. This will require security systems, policies, personnel and processes at the State, County and PSAP levels. From a King County strategic planning perspective, this will be an ongoing process throughout the 10-year planning period.

Implementation of the Policy Routing Function – The NENA i3 architecture will allow IP Routing rules to be established that can provide increased flexibility on how calls get routed to alternate PSAPs if capacity or connectivity isn't available and the Primary PSAP initially targeted for the call. This can allow interagency agreements to be established between PSAPs that would allow them to provide backup or surge capacity for each other and to have these call routing plans already pre-established in the Policies applied in the call routing function. From the perspective of the ESInet itself, this functionality should be available by the beginning of 2018. The actual implementation of Policy Routing will depend on each County 911 Program working with their PSAPs (and/or neighboring PSAPs) to establish agreements for any desired routing policies. It is anticipated this work would take place in the 2018-19 timeframe.

Implementation of Additional Data Repository (ADR) functionality – This database will allow additional information about the caller (such as pre-existing medical information, specific location or routing information, etc.) to be stored within the ESInet so that it can be retrieved by any PSAP receiving a 911 call from that caller. This Repository will also be used for the "LocationbyReference" information needed for delivering pseudo-location information for wireless calls that can then be queried for the actual geo-coordinate information for the caller for mapping display. As with the Policy Routing Function, this functionality will be in place by the beginning of 2018, but County 911 Programs and PSAPs may not begin utilizing it for specific caller information until they have put in place policies and practices for what information will be

stored and how it will be maintained. This could conceivably take place in the 2018-19 timeframe similar to working out any Policy Routing processes and agreements.

Implementation of Location information with Calls – Within the NENA i3 architecture, 911 calls from wireline and static VoIP devices will query the Location Information Server (LIS) to determine the location of the caller and pass this "LocationbyValue" information to the PSAP along with the SIP call traffic. This replaces the current Automatic Location Information (ALI) database lookup that the PSAP CPE currently performs in the existing system architecture. For wireless and dynamic VoIP calls, the "LocationbyReference" process will be used to store the actual geo-coordinate location of the calling device (likely in the ADR described above) so it can be queried and utilized by the PSAP CPE once the call arrives. This capability won't be fully available until all carriers complete their transition to full NENA i3 SIP call delivery.

Agency Locator Support – The NENA i3 architecture identifies a large number of data elements that are logged as a part of the call flow, and the logging service can reside within the ESInet itself or at the PSAP. Each logged element creates an "Agency Locator Record" that includes a Universal Resource Identifier (URI) address to the logging service where the element is stored so that this logged data can be queried by the PSAPs if needed. As with other core ESInet functions, this capability will be in place at the completion of the ESInet II deployment in early 2018. The degree to which the logged data will be utilized by the PSAPs will depend on when they complete their full migration to NENA i3 compatible interfacing to the ESInet, so likely in the 2018-19 timeframe.

Appendix D: Architectural Options

*NG911 Readiness Objective #4 – **Evaluate and Adopt a System Architecture***

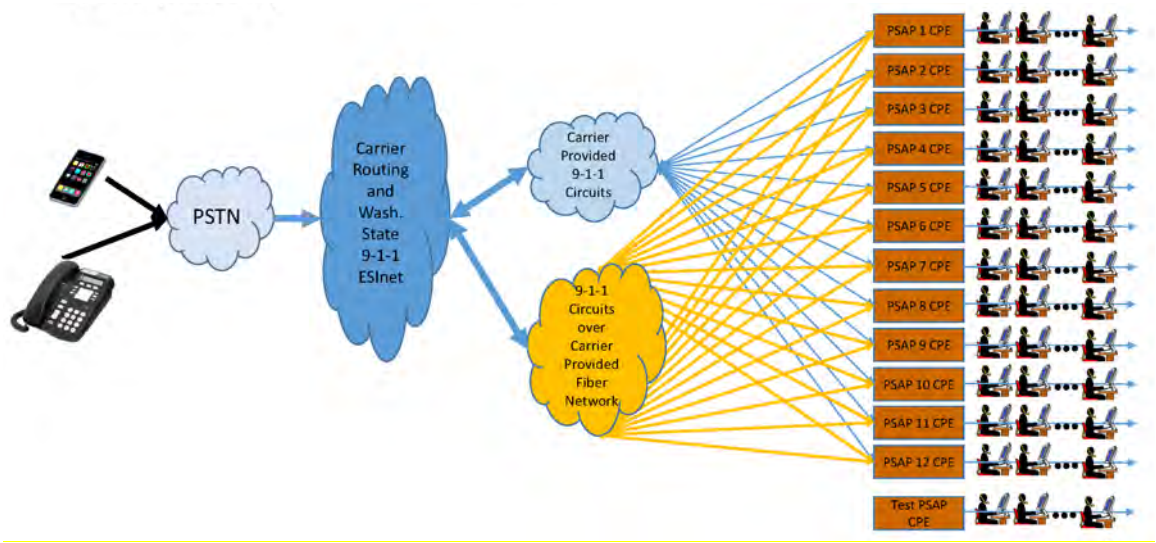
King County will identify an overall system architecture for NG911 capable telephone systems and networking to allow King County PSAPs to effectively access and utilize the identified NG911 Features and Functions.

(Goals: Meet or Exceed Industry Standards; Seamless System-wide Technology; Secure, Resilient and Survivable.)

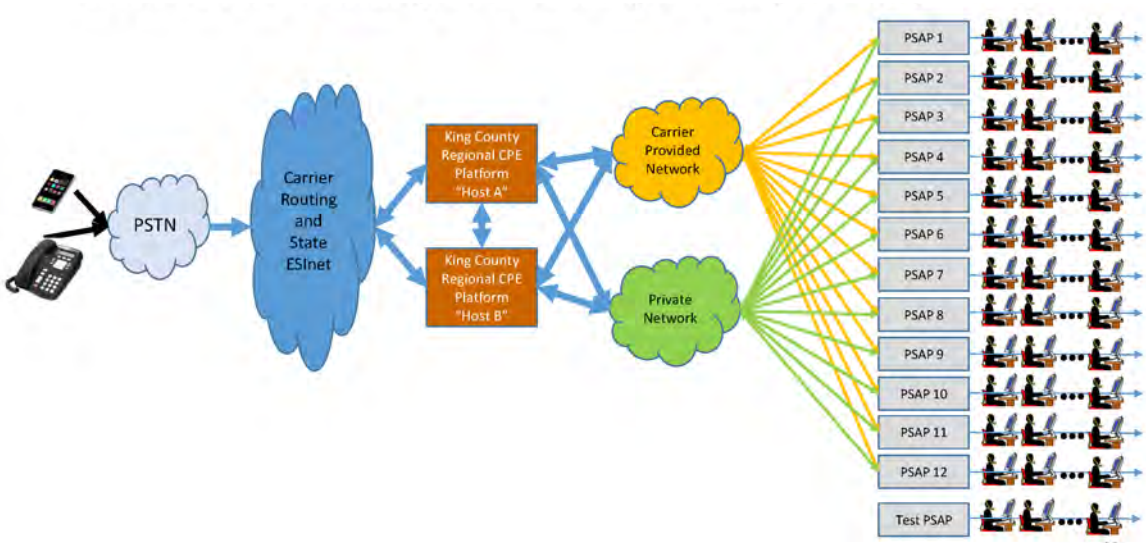
The following **Actions** will be followed:

A. **Identify Options** – Review architectural options for maximum interoperable efficiency, with the desired Features and Functions, and an ability to phase into NG911 over next 10 years. This is done. The options are diagramed on the following pages:

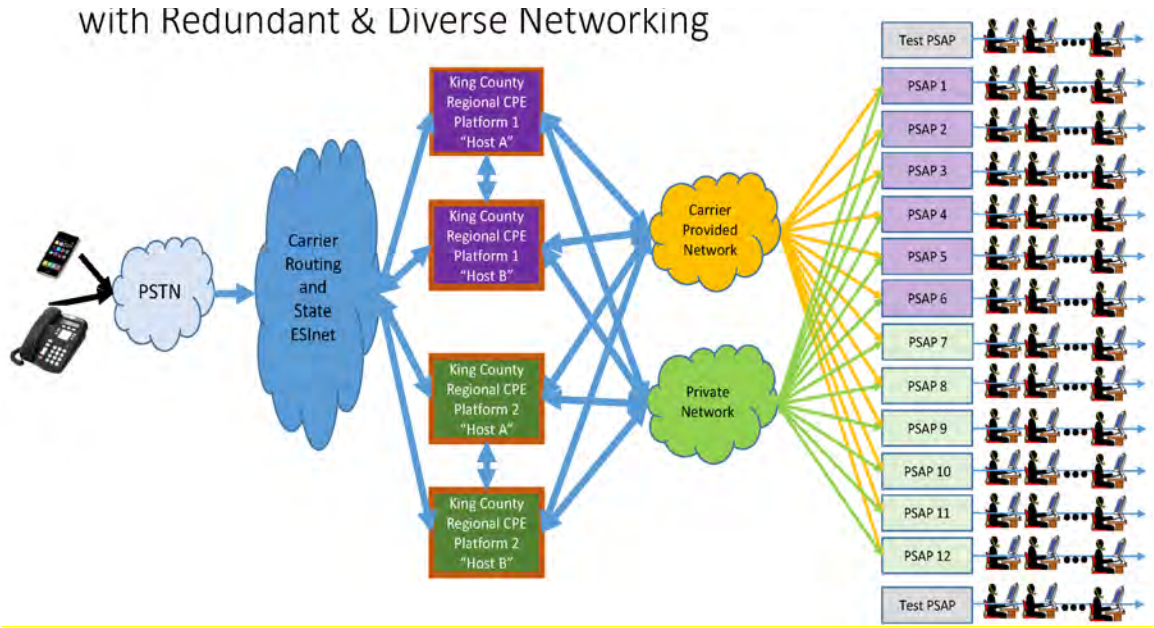
Option 1: Decentralized – Continue the current decentralized system architecture with each PSAP equipped with NG911 system equipment and directly interfaced to the State ESInet.



Option 2: Single Platform – Pursue a Single Platform strategy with a single NG911 system core, geo-diverse nodes, and diverse communications networks to NG911 workstations at all PSAPs.



Option 3: Dual Platform – Pursue a Dual Platform strategy, both with geo-diverse nodes and diverse communication networks to all PSAPs



B. **Review Options on Functionality** – Review architecture options from reliability, supportability and survivability perspectives, as well as the Architectural Principles. In progress. Done by May.

C. **Review Options on Financial Criteria** – Coordinate with Finance Task Force to assess financial/resource impacts of each architectural option. Timing?

Measurements relative to these Strategies have not yet been formulated, but will include a timeline for assessment of architectural options, a timeline for making decisions on any architectural changes, and a timeline for implementing any architectural changes. [Doesn't this need to be complete during Strategic Planning?]